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TRENDS IN JOB QUALITY DURING THE GREAT RECESSION: A COMPARATIVE APPROACH FOR THE EU

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ABSTRACT

This paper focuses on the consequences of the crisis on job quality in Europe. Its aim is twofold: first, to identify trends in job quality in the EU during the 2007-2009 crisis; secondly, to explore the link between these trends and cyclical as well as institutional factors. It relies on European surveys data (European Working Conditions Survey, Labour Force Survey, EU-SILC).

A first step of the analysis relies on synthetic indices of job quality developed in previous researches (ETUI Job Quality Index) and compares 2005 and 2010. In average in the EU the aggregate index shows a marginal overall decline in job quality between 2005 and 2010. Improvements are visible with regard to working conditions, working-time and work-life balance. However, involuntary non-standard employment has increased and wages display a pronounced deterioration. Slight declines are also visible in skills and career development and in collective interest representation. At the national level some countries exhibit a more than marginal improvement in overall job quality (Poland, Czech Republic, Belgium and Denmark), whereas others see marked declines in job quality (Ireland and France).

A second step builds on dynamic indicators calculated at the individual level. They account for individual transitions in terms of job quality during the trough of the economic downturn (between 2007 and 2009), using EU-SILC panel data.

Using multi-level logistic regressions, the paper assesses the contribution of both individual and country-level characteristics (institutions and business-cycle indicators) to a possible deterioration in job quality.

It shows that some socio-economic groups are more affected by decreasing trends in job quality (other things being equal), especially youth, older workers and low-educated workers. Women seem less affected by these negative trends than men but are more likely than men to become unemployed or inactive over the period. Cross-country heterogeneity in job quality trends can be related to economic trends (unemployment variation) and, to a minor extent, to the employment distribution by sectors. Some labour market institutions also seem to play a role in explaining the evolution of job quality in times of crisis: employment protection legislation (as defined by the OECD) prevents individual transitions to non-employment (and has no direct effect on job quality) while public expenditure per unemployed slightly reduces the risk of job quality deterioration.

Keywords: Job quality, European comparisons, crisis, labour market transitions, labour market institutions, synthetic index.

Tendances de la qualité de l'emploi pendant la crise : une approche européenne comparative

Résumé

L'objectif du document est d'analyser les conséquences de la crise sur la qualité de l'emploi en Europe. Il identifie tout d'abord les tendances de la qualité de l'emploi pendant l'épisode de crise, avant d'explorer les liens entre ces évolutions et des facteurs conjoncturels et institutionnels. Les données utilisées proviennent des principales bases européennes (Enquête sur les Forces de Travail, Enquêtes sur les Conditions de Travail, panel EU-SILC).

Une première étape repose sur des indicateurs synthétiques de qualité de l'emploi développés dans des travaux antérieurs (Index de Qualité de l'Emploi proposé par ETUI. En moyenne pour l'Union européenne, la qualité de l'emploi globale ainsi mesurée décline légèrement entre 2005 et 2010. Des améliorations sont visibles concernant les conditions de travail et la conciliation entre vie familiale et vie professionnelle, mais les indicateurs de salaires et de contrats atypiques se dégradent. Au niveau national, quelques pays connaissent une amélioration de leur qualité de l'emploi (Pologne, République tchèque, Belgique et Danemark), tandis qu'elle se dégrade dans la plupart des pays, cette tendance négative étant plus importante en France et en Irlande.

Une deuxième étape s'appuie sur des indicateurs dynamiques, calculés sur une base individuelle à partir du panel SILC, et mesurant les transitions en termes de qualité entre 2007 et 2009. À partir de régressions logistiques multi-niveaux, on estime la relation entre les caractéristiques des individus et des pays, et la probabilité de connaître une dégradation de la qualité de l'emploi ou d'aller vers le non-emploi (chômage ou inactivité). Les résultats montrent que certains groupes sont plus affectés que d'autres par le risque de détérioration de leur qualité de l'emploi, en particulier les jeunes, les seniors et les personnes ayant un faible niveau de qualification. Les femmes semblent moins affectées que les hommes par ce risque, mais elles connaissent une probabilité plus élevée de transition vers le non-emploi. Les différences entre pays sont reliées aux variations conjoncturelles (ampleur de l'augmentation du chômage), et à des facteurs sectoriels. Certaines institutions semblent également jouer un rôle : la législation de protection de l'emploi est associée à de plus faibles risques de transition vers le non-emploi, et n'a pas de lien direct avec la variation de la qualité ; la dépense publique par chômeur (politiques de l'emploi) réduit légèrement le risque de dégradation de la qualité de l'emploi des individus.

Mots-clés : *Qualité de l'emploi, comparaisons européennes, transitions sur le marché du travail, institutions du marché du travail, index synthétique.*

INTRODUCTION

While job quality has been intensively researched over the last ten years, in the context both of national debates and of some policy developments at the international level (ILO Decent work agenda in 1999 and European Employment Strategy since 2001), comparative studies are still relatively few. Moreover, such studies as do exist differ on the question of how best to capture job quality. There is an ongoing debate about whether several constitutive dimensions should be taken into account or whether job quality should be summarized by means of a single variable. Some recent empirical work has been devoted to different components in a dynamic perspective: the 'job monitor' uses the growth of wage quintiles to measure trends in job quality in EU countries (Eurofound, 2008); Pichler and Steiber (2011) analyze job quality evolution on the basis of the European Working Conditions Survey, using work autonomy as an indicator. Existing multi-dimensional frameworks include factors such as skills, work effort and intensification, worker discretion, wages, risk and job insecurity, and workers' well-being (Leschke and Watt 2008a and 2008b; Green, 2006; Gallie, 2007; Muñoz de Bustillo *et al*., 2011). Some take a broader labour market perspective covering socio-economic security (wages and work contract), skills and training opportunities, working conditions, gender equality and work-life balance (Davoine, Erhel, Guergoat-Larivière, 2008). Such multi-dimensional frameworks have been used for both comparative and dynamic analysis. Job quality can be analyzed and discussed both as an individual-based concept (the quality of one's job), and also as a macroeconomic concept (the quality of jobs in a country). In this paper, we will follow the lines of multi-dimensional approaches, while attempting to deal with both the individual and aggregate levels, in a comparative perspective.

The main issues analyzed in this empirical literature are the heterogeneity of job quality across countries, the trends over the last twenty years, and the relevance of a quantity-quality trade-off for job creation. Depending on the dimensions included in the analysis and the countries covered, the outcomes are not clear-cut. Some studies point to a deterioration in job quality in correlation with the intensification and flexibilisation of work, and others to its improvement as the result of economic development, and more particularly deindustrialisation with its impact on improved physical working conditions, and increased possibilities for achieving a satisfactory work-life balance.

Very few studies, however, cover the most recent years following the 2007 economic downturn (exceptions for the EU are Hurley and Storrie [2011] focusing on wages, and the ongoing work by Green and Mostafa [2012] using the European Working Conditions Survey). Indeed, the crisis and the associated rise in unemployment might have two-way effects on job quality: on the one hand, workers come under threat of losing their jobs, which reduces their bargaining power, thereby exerting downward pressure on job quality; on the other hand, recession leads to the destruction of some of the low-productivity, flexible and marginal jobs that often combine a whole series of negative features (short-term contracts, short working hours, low wages, etc). Moreover, job losses were not distributed equally over different sectors, leading to impacts on aggregate job quality attributable to compositional effects. Given these contradictory trends, as well as differences in the intensity of the crisis and the consequences for the labour market in different countries, the dynamics of job quality over this period and the evolution of inter-country differences remain difficult to pin down.

Building on our earlier work, this paper further develops the empirical approach with a focus on the consequences of the crisis on job quality. Its aim is twofold: first, to identify trends in job quality in the EU during the 2007-2009 crisis; secondly, to explore the links between these trends and cyclical as well as institutional factors. This will be done at both the aggregate and the individual level, in an effort to test the hypothesis that these cross-country differences are of significance in seeking to explain job quality trends. The focus on the EU relates not only to the need to obtain comparable data on a relatively large-scale sample of countries over several years[1], but also to the structural characteristics of the EU27 that exhibit a high level of heterogeneity among countries in terms of economic development level and institutional setting (labour regulations, social protection, etc.) as well as in terms of the labour market impact of the crisis.

The paper is organized as follows. The first section proposes aggregated indices for job quality and some decomposition by dimension. It relies on synthetic indices of job quality developed in previous research (Leschke and Watt, 2008a and 2008b) and compares 2005 and 2010. The second section builds on dynamic indicators calculated at the individual level that account for transitions in terms of job quality during the trough of the economic downturn (between 2007 and 2009), using EU-SILC panel data. The third section, using multi-level logistic regressions, aims at assessing the contribution of both individual and country-level characteristics (institutions and business-cycle indicators) to the probability of an outcome displaying a deterioration in job quality.

1. CROSS-COUNTRY DEVELOPMENTS IN JOB QUALITY BETWEEN 2005 AND 2010 ACCORDING TO THE *JOB QUALITY INDEX*

This section uses a synthetic job quality index based on six sub-indices capturing wages, involuntary non-standard forms of employment, working time and work-life balance, working conditions and job security, skills and career development, and collective interest representation[2]. On the basis of this index, we discuss the changes in job quality between 2005 and 2010 not least in the light of the economic crisis that swept through Europe from 2008 (and as early as 2007 in some countries). It is important to emphasize, however, that the results on the changes in job quality in its various dimensions cannot be interpreted as simply reflecting the impact of the crisis. They also reflect developments before the crisis (2005-2008) which differ between countries and that were, in a number of cases, characterized by an economic boom and sharply tightening labour markets. Moreover, the findings also reflect longer-term secular trends such as tertiarisation[3].

1.1. The differentiated impact of the crisis across Europe

In order to evaluate the performance of countries on the various dimensions of job quality over the 2005 to 2010 period it is useful to begin by recalling the differential impact of the

[1] In practice we use European Labour Force Survey (LFS), European Union Statistics on Income and Living Conditions (EU-SILC), European Working Conditions Survey (EWCS).

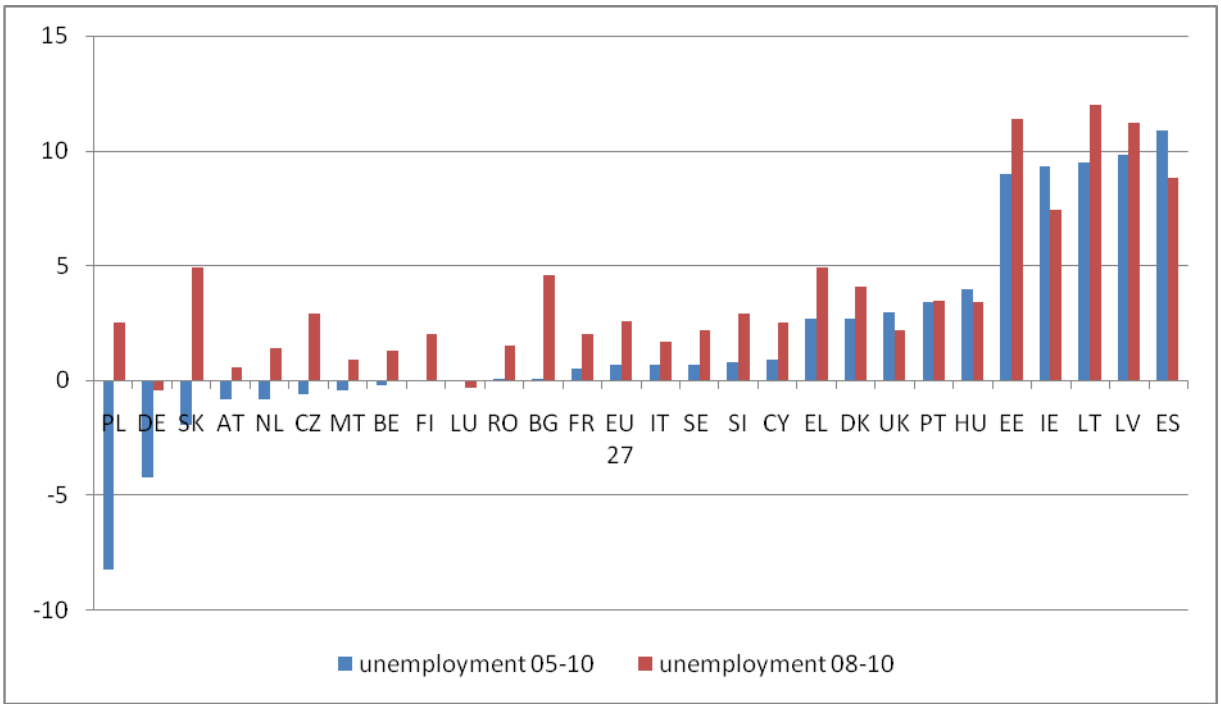
[2] The authors would like to thank Mairead Finn for the collection and preparation of the data of the synthetic job quality index.

[3] One of the main data sources used for constructing the JQI, the EWCS data, is only available at a five-year interval.

economic crisis on the economies and labour markets of EU countries (see also Leschke and Watt 2010) and also the period immediately prior to the crisis.

Figure 1 shows results for the quantitative impact on EU labour markets as represented by changes in unemployment rates[4]. Starting with the performance over the period as a whole, we see that eight countries managed to reduce the national unemployment rate between 2005 and 2010. Poland was particularly successful, but Germany, Slovakia and Austria also saw substantial falls in unemployment. The overall rise in unemployment was most pronounced in Spain, followed by the Baltics and Ireland. Hungary, the UK, Denmark, Portugal and Greece also saw substantial increases. This mostly reflected massive hikes in unemployment in the 2008-2010 period. It is worth noting, however, that there was also a sharp rise in unemployment in some countries during the crisis despite the fact that, over the period as a whole, they enjoyed declining unemployment (notably Poland, Slovakia, Czech Republic) or no overall change (Bulgaria).

Figure 1. Unemployment rate, %-point change, 2005-2010 and 2008-2010



Source: *Labour Force Survey*, 2005-2010, own calculations.

This provides a framework against which to analyze developments in job quality. Our analysis is based on a synthetic index called JQI (Job Quality Index) (Leschke, Watt, Finn, 2008; Leschke, Watt, Finn, 2012) which includes six dimensions (for details on the construction of the index and its components, see Appendix 1):

- Wages (nominal compensation per employee in PPS, in-work poverty)

[4] Variations of GDP are presented on Figure A1 in Appendix 1.

- Non-standard form of employment (involuntary temporary employment, involuntary part-time employment)[5]

- Working time and work-life balance (long and atypical hours[6], voluntary part-time work, satisfaction with working time)

- Working conditions and job security (work intensity, work autonomy, physical work factors, perception of job security)

- Skills and career development (training, prospects for career advancement)

- Collective interest representation (collective bargaining coverage, trade union density).

1.2. Relationship between job quantity and job quality: what do we expect?

Can we uncover a systematic relationship across countries between recent labour market developments – driven substantially by the depth and duration of the crisis – and developments in terms of job quality? Two hypotheses that are likely to lead to opposing impacts on job quality can be put forward: the rise in unemployment and the declining bargaining power of labour brought on by the crisis might both be expected to have a deleterious effect on the quality of existing jobs. On the other hand, there may be compositional effects, specifically the more than proportional destruction of poor-quality jobs that actually push up average national job quality as measured by the JQI. As they cancel each other out, it may be difficult to distinguish these effects using the aggregate data on which the JQI is based. The sub-indices are expected to differ in their sensitivity to the overall crisis impacts but also regarding the importance of the bargaining *vs* the composition hypotheses. Some of the indicators (for instance in collective interest representation) are institutional in nature and thus likely to be slow-moving; crisis effects will not be anticipated in the short time span considered here. In other areas lags are likely to be shorter (*e.g.* concerns about job security, working time, non-standard employment).

1.3. Overall evolution of JQI in EU countries and differences by gender

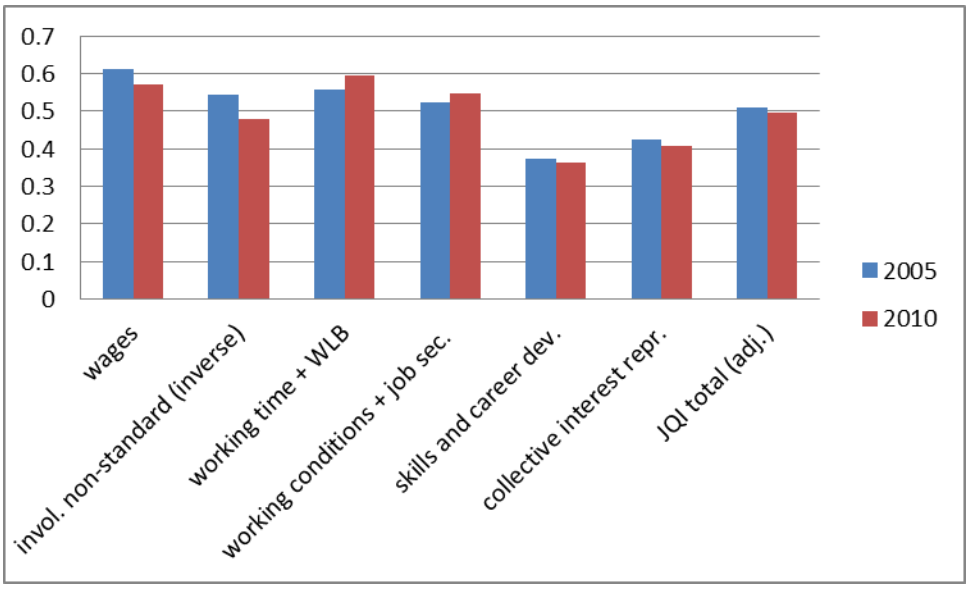
Looking at the average developments over time, a marginal overall decline in job quality between 2005 and 2010 is observed (Figure 2). Improvements are visible with regard to working conditions and working-time and work-life balance. On the other hand, marked deteriorations on the wages[7] and the involuntary non-standard employment sub-indices are evident. Slight declines are also visible in skills and career development and in collective interest representation.

[5]This sub-index is inverted, i.e. higher level of involuntary non-standard jobs contributes negatively to the job quality index.

[6]Both inverted.

[7] It is important to note that the wage data in the '2005' JQI were actually from 2007; this choice was made at the time to ensure that the most up-to-date data available were used. In this case, the points made on various occasions below, that the period considered includes both 'boom' and 'bust' phases, does not apply.

Figure 2. Changes in sub-indices between 2005 and 2010, EU27

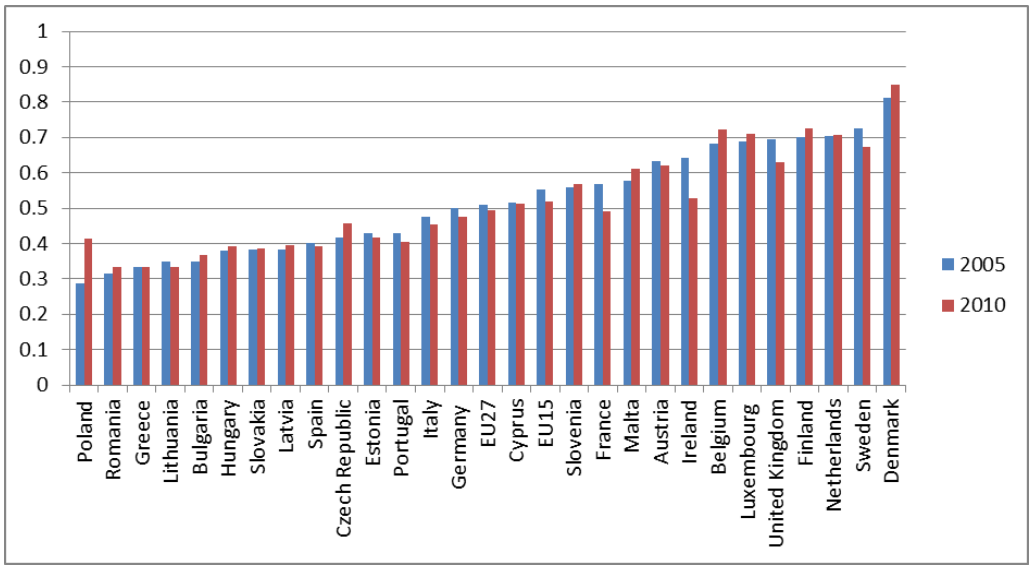


Data Sources: Ameco, European Labour Force Survey (LFS), National Accounts, European Working Conditions Survey (EWCS), EU-SILC, ICTWSS database, own calculations.

The disaggregation by gender reveals only very small differences with regard to changes over time according to the six sub-indices and the overall JQI. The direction of change is the same in all cases. The decline in the overall JQI is slightly more pronounced among women, this being the reflection of rather more pronounced declines or less pronounced improvements across all the five sub-indices that are gendered. Having said this, it is important to consider, however, that, in spite of similar overall job quality for men and women, the outcomes by gender differ markedly between sub-indices: As is well known men receive higher wages (gender pay gap) and are less affected by involuntary part-time and fixed-term work. Women, on the other hand, do better on the sub-index of working time and work-life balance – also due to constraint choices they are taking due to, in particular, family obligations – and on working conditions which is the reflection of, among other things, sectoral segregation (see Appendix, Figure A2).

Figure 3 shows developments in overall job quality by country. We see the following countries with a more than marginal improvement in overall job quality (ranked by the absolute size of the improvement): Poland, Czech Republic, Belgium and Denmark. By contrast, Ireland and France saw marked declines in job quality. Across the distribution we do not see a clear pattern of either convergence or divergence among countries. This is apparent from, among other things, the fact that both the lowest and highest performing country in 2005 – Poland and Denmark – experienced substantial increases. Disaggregating changes in the JQI by gender does not in most cases reveal major differences. Notably those countries with substantial improvements or deteriorations tended to register a balanced development between men and women. Neither in regional terms nor in terms of the size of the economic crisis impact do we see clear patterns in terms of change in overall job quality. It follows that we should look in more detail at the different dimensions of job quality.

Figure 3. Developments in overall JQI by country, 2005-2010



Data Sources: Ameco, LFS, National Accounts, EWCS, EU-SILC, ICTWSS database, own calculations.

The most pronounced improvements and deteriorations according to the six dimensions are summarized in Table 1[8].

Table 1. Most pronounced improvements and deteriorations in JQI total and sub-indices – 2005-2010

	Wages	**Involuntary non-standard (inverted)**	**Working-time and WLB**	**Working conditions and job security**	**Skills and career develop-ment**	**Collective interest represen-tation**	**JQI total**
Improvement	IE	PL, BE, LT	RO, PL, LV, SK, HU, BG	CZ, PT, PL, DE, FI	LU, PL, CY, EE, BE		PL, CZ, BE, DK
Deterioration	RO, DE	IE, IT, UK	FR	IE, LU, FR, SE	FR, SE	SK, PT, EE	IE, FR, UK, SE

Note: based on own calculations, only results for improvements and deteriorations of more than +/- 0.1 compared with the respective EU27 average are displayed. In the case of the overall JQI +/- 0.04 was used. Countries are displayed in the order of the magnitude of improvement and, respectively, deterioration.

Few countries show marked improvements or deteriorations in more than one sub-index. Exceptions are Poland, France, Sweden, Belgium and Ireland. Poland, the country with the largest total improvement, is a clear-cut example with marked improvements in all sub-indices but wages and collective interest representation – albeit from a very low starting point. The other three countries that show marked improvements in overall job quality have very different profiles. Belgium improves markedly on both involuntary non-standard

[8]See appendixTable A2 for the absolute changes for each country and sub-index.

employment and skills and career development. The Czech Republic shows marked improvements on working conditions and job security. While Denmark, using the cut-off points specified above, does not figure in any of the six sub-indices, it is, nonetheless, very close to the group with the largest improvements with regard to three dimensions (working time and WLB, working conditions and job security and skills and career development) (appendix, Table A2).

Ireland, the country with the largest negative development in overall job quality, is an interesting case in that it combines deteriorations of large magnitude in two fields – involuntary non-standard employment and working conditions – with improvements in terms of the sub-index wages[9]. France, the country with the second largest decline in overall job quality, shows marked deteriorations in three fields: working time and work-life balance, working conditions and job security, and skills and career development (see box below). The UK shows an overall negative trend that is particularly due to negative developments with regard to involuntary non-standard employment. With the exception of wages, developments over time were, however, negative in all sub-fields of job quality (appendix, Table A2). Sweden displays noticeable declines in two fields – working conditions and job security, and skills and career developments.

1.4. Relationship between job quantity and job quality: first results from 2005-2010 data

We now broaden the discussion beyond the most pronounced improvements and deteriorations and consider somewhat more broadly the results in each sub-index – details of which can be found in appendix Table A2 – in the light of the above discussion about the differential impact of the economic crisis on growth and unemployment. Some suggestive linkages emerge but no consistent overall picture (Figure 4). Most obviously, the country with the greatest job quality improvement according to our index, Poland, also enjoyed the strongest real economic growth and the sharpest fall in unemployment. This would seem to indicate that quantitative and qualitative improvements are indeed complementary and probably reflect a mixture of technological upgrading, sectoral change and an improvement in workers' bargaining power. Conversely, Ireland, the country which suffered the sharpest fall in the JQI was one of the countries worst hit by the crisis.

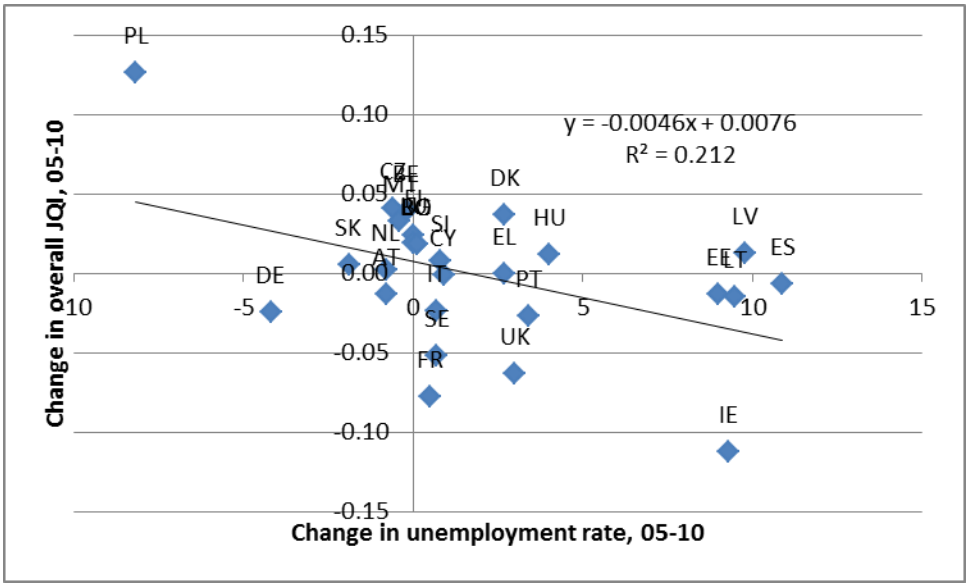
The pattern of change in quantitative terms and our overall measure of job quality is not consistent, however, as is illustrated by the other three countries that substantially improved their performance between 2005 and 2010. Belgium and the Czech Republic were negatively affected by the crisis to a below average extent, but Denmark, the best overall performer in 2005 and 2010 saw no economic growth and experienced a substantial rise in unemployment over the period. To the extent that bargaining power is a factor, it may be that there are lags in the transmission from 'quantity to quality': Denmark, prior to the crisis, had enjoyed an extended period of close to full employment, the impact of which on quality may have been initially maintained despite rising unemployment; alternatively an offsetting composition effect may have been at work. At the other end of the distribution, France, with the second most pronounced decline in job quality, had economic and labour market impacts in 2005-2010 that were very close to the EU27 average. And it is noticeable

[9] In the case of Ireland, the improvement in 'wages' largely reflects the fact that while in Europe as a whole the share of working poor – which is 30% of the sub-index – rose, in Ireland it fell. This may also be a compositional effect (job losses at the bottom, income losses at the top of the wage distribution).

that many of the other countries hardest hit by the crisis (Spain and the Baltics) showed rather minor declines in the overall JQI (Latvia even showed a small increase).

As a first result of cross-country analysis between 2005 and 2010, the links between job quality and the intensity of the crisis appear rather weak (see Figure 4). This could be explained by the observation period, which does not coincide with the economic downturn, but it reveals also that there are other determinants of job quality trends, such as the structure of employment by sector and occupation (Amossé and Kalugina, 2013), as well as some institutional factors.

Figure 4. Change in the unemployment rate between 2005 and 2010 and change in the overall JQI, 2005-2010



Data Sources: Ameco, LFS, National Accounts, EWCS, EU-SILC, ICTWSS database, own calculations.

1.5. What evolution of each dimension of JQI over the crisis?

Turning now to the sub-indices, this picture is broadly confirmed. There does appear to be *some* link between the size of the economic and labour market shock and job quality performance on the various aspects of job quality, but any such link is rather tenuous and, as hypothesized above, is stronger for some sub-indices. It seems plausible once again to invoke differential lags as a likely explanation.

With regard to the wage sub-index, little correlation between quantitative labour market developments and this aspect of job quality emerges. Countries with the greatest positive change include both Poland and Ireland, with entirely different economic and labour market developments. (As noted above, in the case of Ireland, the distributional component played an important role.) At the other end of the scale, we have crisis-hit countries such as Greece, but also Germany. As mentioned above, the wages comparison is between the years 2007 and 2010. This is a too short period to identify meaningful trends, especially given the lags involved.

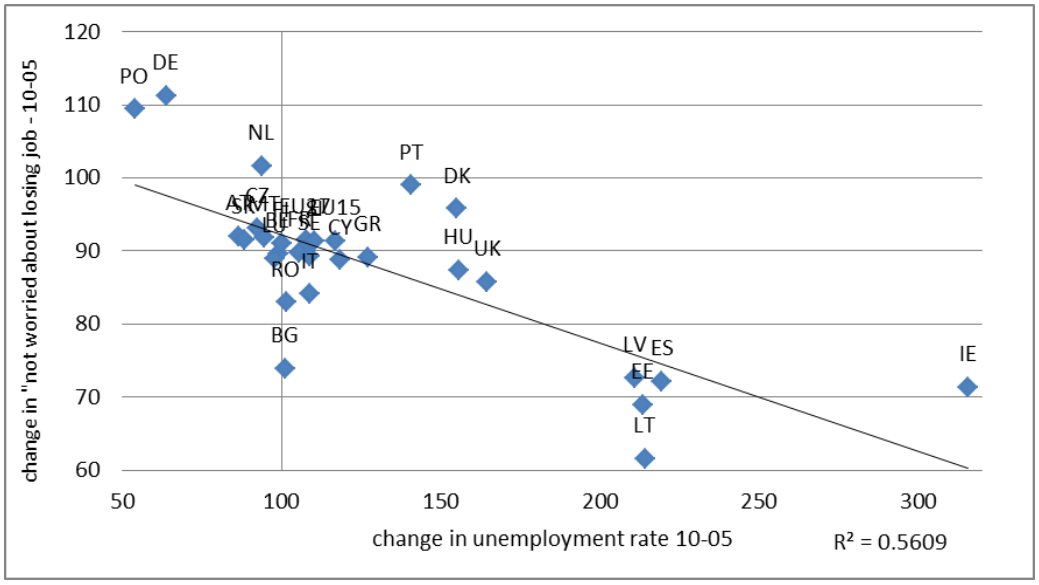
In the case of *non-standard employment*, the relationship does, however, seem rather clear-cut. The worst instances of deterioration are to be found in the southern periphery and in Ireland and the UK, while the greatest improvements were among countries with, relatively speaking, favourable economic and unemployment trends (Poland, Belgium, Finland, Luxembourg and Germany). This is confirmed by a positive statistical correlation (not shown) that is stronger than for the overall JQI ($R^2 = 0.27$). Both involuntary temporary employment and involuntary part-time employment contributed to the large decline in the involuntary sub-index in Ireland, Italy and the UK. This suggests that, in these countries, employers enforced working time reductions and/or made increased use of fixed-term contracts that were seen as negative from the workers' perspective. In Spain, by contrast, other work by the authors (Leschke and Watt 2010) showed very large composition effects: fixed-term workers, in particular, bore the brunt of the labour market adjustment, with the consequence that their share of total employment declined substantially. The countries with marked improvements in this sub-index had more varied patterns. Poland, with a tightening labour market over much of the period, saw a fall in the part-time share, with more workers taken on in full-time positions and, presumably, some conversion of part-time to full time jobs. In addition, fewer of these part-timers reported that they could not find a full-time job.

In the case of *working time and work-life balance* it seems rather that a secular and regionally specific trend is significant: all the substantial improvements occurred in Central and Eastern Countries (CEE) countries – with improvements across all the four indicators in virtually all cases. There has been a fall in the incidence of long and atypical working hours, whereas the two indicators that try to capture work-life balance show a consistent improvement. This may reflect the fact that companies in crisis have reduced overtime work and scrapped extra shifts. Declines were registered only by western European countries. The three countries with the biggest declines are countries with a relatively favourable (Germany) average (France) and unfavourable (Greece) experience over the 2005-2010 period; the crisis thus seems not to have had a consistent impact on this dimension.

With regard to the sub-index *working conditions and job security*, particularly the latter variable which picks up 'subjective job security' is expected to be impacted directly by rising unemployment. And indeed, not only does the overall level of unemployment matter (not shown) but there is also a strong negative correlation between the changes in unemployment and the changes in the share of people not worried about losing their job (Figure 5)[10]. Germany and Poland, the countries that experienced the most marked declines in unemployment in the period 2005 and 2010, are the only ones where the share of people not worried about job security increased noticeably. The opposite is true for the Baltics, Spain and Ireland, all of which doubled or, in the case of Ireland, tripled their unemployment rate between 2005 and 2010, and particularly during the economic crisis; and which, during the same period, saw the share of people not worried about losing their job decline by around 30% and – in the case of Lithuania – close to 40%. These findings illustrate the relationship between labour market performance and subjective indicators of job quality.

[10] Reference periods are 2005 and 2010 as these are the years when the EWCS data was collected.

Figure 5. Changes in unemployment rate and changes in share of people 'not worried about losing job', 2010-2005



Source: LFS and EWCS, own calculations.

In terms of working conditions (work intensity, autonomy and physical work factors) there is some evidence that composition effects have statistically served to raise job quality in this dimension, while the economic slack, whatever its other negative impacts, has in many cases reduced stress and pressure at work, at least for some workers. At the same time, the rather positive experiences in Germany and especially Poland and the negative trends in Ireland are in line with the bargaining power hypothesis in which good (bad) labour market developments exert upward (downward) pressure on job quality. All in all, however, it turns out to be rather difficult to judge more fully the impact of labour market developments, and more particularly the crisis, on this sub-index, as there are too many intervening factors that cannot easily be disentangled. It would be helpful in many countries to have data for 2007 or 2008 (which, however, are not available due to the five-year interval between EWCSs), the point which the crisis broke, as the 2005-2010 observation period may be having the effect of averaging out (and thus obscuring) the impact of good and bad labour market trends before and after the onset of the crisis (for an in-depth discussion of the crisis impact on this sub-index compare Leschke *et al.* [2012] section 4).

Moving to *skills and career development*, we see that both the improver group and those suffering a decline in this aspect of job quality contain some countries badly and others relatively lightly affected by the crisis: Estonia and Poland, and Lithuania and Sweden respectively. The same conclusion can be drawn for *collective interest representation*, an institutional variable that is relatively slow moving.

Aggregate analysis of job quality reveals some correlation between the economic cycle and global trends in job quality but it concentrates on the 'non-standard employment' dimension and on subjective indicators.

One limit of the JQI is that it can only be calculated in 2005 and 2010. In the following sections, we will focus on the 2007-2009 period using a more limited set of indicators.

Box-A. Focus on France and deteriorating job quality between 2005 and 2010

According to the JQI, job quality in France exhibits a marked deterioration between 2005 and 2010. Going back to the indicators on which the JQI is built, it appears actually that almost all indicators have been deteriorating. In this box, we comment on these evolutions by sub-index.

- Concerning wages, nominal compensation appears stable, but the in-work poverty rate is displaying a small rise;

- Concerning non-standard forms of employment, part-time is stable, whereas the temporary employment rate is rising slowly, as is also the share of involuntary temporary employment;

- Concerning working time and work-life balance, there is a noticeable increase in long working hours, which is accompanied by a diminishing share of employees declaring that 'working hours fit in with family/social arrangements';

- Concerning working conditions, EWCS data reveal an increase in the share of workers declaring high work intensity, as well as a reducing work autonomy; the proportion of people who are feeling job insecurity is growing; the only positive evolution concerns physical stress, which is decreasing. Such trends are general quite across the EU;

- Concerning skills and career development, both participation in education and training and the perception of career advancement prospects have decreased;

- Concerning collective interest representation, collective bargaining coverage and trade union density are lower in 2010 than they were in 2005.

Job quality indicators, France, 2005-2010

	2005	**2010**
Nominal compensation per employee (+)	*40,5*	*40*
In work poverty (-)	*6*	*6,6*
Total population in temporary employment because they cannot find a permanent job (-)	*7,84*	*8,607*
Total population in part-time employment because they cannot find a full-time job (-)	*5,7*	*5,565*
Working hours fitting work-family conciliation (+)	*80,9*	*79,5*
Antisocial working hours (-)	*15,5*	*15,3*
Share of employees working more than 40 hours a week (-)	*13,6*	*16,3*
%voluntary part time work (+)	*3,38*	*3,38*
Intensity of work (-)	*30,8*	*32,79*
Physical stress (-)	*79,2*	*76,4*
Work autonomy (+)	*65,5*	*61,8*
Not feeling job insecurity (+)	*85*	*76,5*
Participation to education and training (+)	*7,5*	*5*
Career advancement prospects (+)	*36,5*	*32,1*
Bargaining (or Union) coverage (+)	*95*	*90*
Net union membership (+)	*8,6*	*7,6*

Note: Definitions of indicators and sources are given in table A1 (appendix 1). The signs indicate if the indicator contributes positively or negatively to the calculation of the global job quality index.

2. JOB QUALITY DEVELOPMENTS AT THE INDIVIDUAL LEVEL BETWEEN 2007 AND 2009

In this part we analyze the trends in job quality using a more limited set of indicators, which can be calculated at the individual level and in a longitudinal perspective. Thus our aim is to disaggregate the analysis and to identify trends through a sample of individuals that were on the labour market in 2007.

Our analysis is based on the EU-SILC panel that follows up individuals over a four-year period in twenty-four European countries[11] and provides information about their labour market and income situation. Although the set of variables available is limited, it is the only comparative dataset that allows such an observation period. We use data for three years (2007 to 2009), so as to characterize individual trajectories between the very beginning of the crisis and 2009[12]. The dataset provides information about individual labour market situation, including some variables that reflect the job-quality indicators considered in the previous section: type of contract (temporary *vs* permanent), part-time *vs* full-time (self-declared), weekly working time and wages, and occupation (ISCO). The latter can be used to proxy skills and career development. In comparison with the multi-dimensional framework presented above, the main limitation here is the absence of information on working conditions, training or collective interest representation dimensions[13], and the fact that the variables provided in the longitudinal survey do not allow a distinction to be made between voluntary and involuntary non-standard employment. Basic individual characteristics are identified, like gender, educational level, and, more interestingly, the number and age of children.

In the following we compare the situation of individuals in 2007 and 2009 focusing on three dimensions: non-standard employment, working time and skills, and career development (through occupational mobility), and concentrate on individual trends rather than on aggregate (country-level) values of indicators[14]. We do not present the results for wages since there is a one-year lag between the survey and the reference year for income: the 2009 survey gives wages for 2008. What is more, wage data are not available for quite a large number of countries in the EU-SILC panel, namely Denmark, Finland, Hungary, Iceland, Malta, The Netherlands, Norway, Slovakia and the UK.

2.1. Non-standard employment: temporary and part-time employment

Non-standard employment rates are globally stable across the EU between 2007 and 2009 (see Figures A3 and A4 in Appendix). In some countries, however, changes are quite significant: temporary jobs have increased in Malta, Portugal, Greece, Poland, Slovenia and

[11] Given missing variables and countries in EU-SILC panel, all EU countries cannot be considered in this part. This part of the analysis includes Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Estonia, France, Finland, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, Spain and the United Kingdom.

[12] As soon as 2010 data become available, we will also analyze 4-year trends.

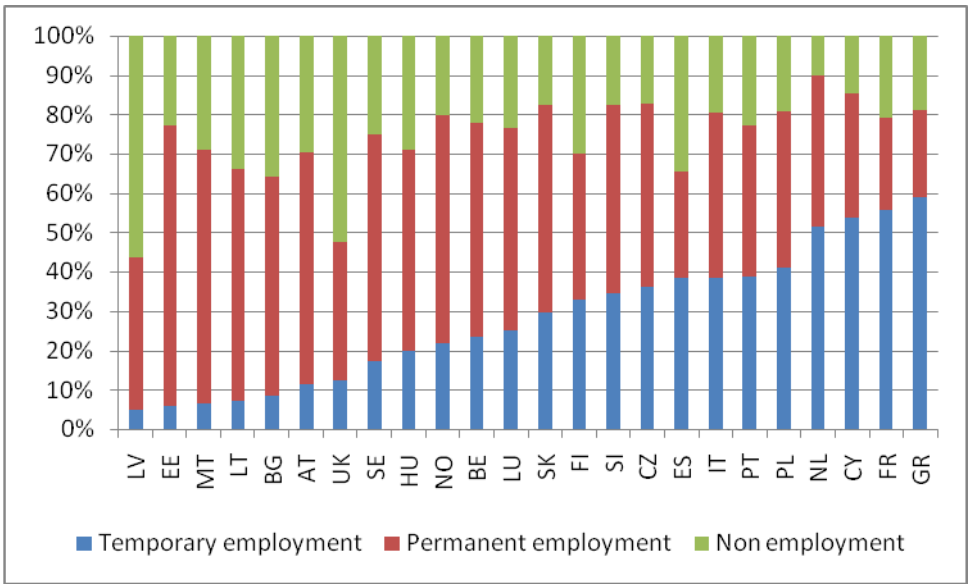
[13] Sub-indices 4, 5 and 6 of the JQI.

[14] Aggregate results at the country level are displayed in the appendix.

France, whereas part-time rates[15] increased in Belgium, Latvia, Malta, Slovenia, Poland and in the UK.

The relative stability of non-standard employment rates conceals important transitions at the individual level between standard and non-standard employment. For permanent workers in 2007, the probability of remaining in a permanent job is high (86% on average in the EU), whereas the probability of moving towards non-employment (11%) or temporary jobs (3%) is limited. For temporary workers in 2007 the risk of being outside employment in 2009 is higher (24% on average in the EU). 40% of them had become permanent workers in 2009, and 37% remained in temporary jobs. Some country specificities appear from transition matrices: in the UK, only 67% of the 2007 permanent workers remained in that situation in 2009, whereas 31% had moved to non-employment. For temporary workers, bad transitions (to non-employment) are far more frequent in the UK and in Latvia (above 50% are concerned), and above the average in Spain, Finland and Bulgaria. Such transitions might be related to job destruction in the crisis that concentrated on temporary jobs (except in the UK, where the share of temporary jobs is very low in a context of deregulated labour markets). Interestingly, transition rates also reveal that persistence of employment in a temporary position is higher in some countries, like France, Greece, or The Netherlands, where more than 50% of temporary workers in 2007 were still in that situation in 2009.

Figure 6. Transitions from temporary employment



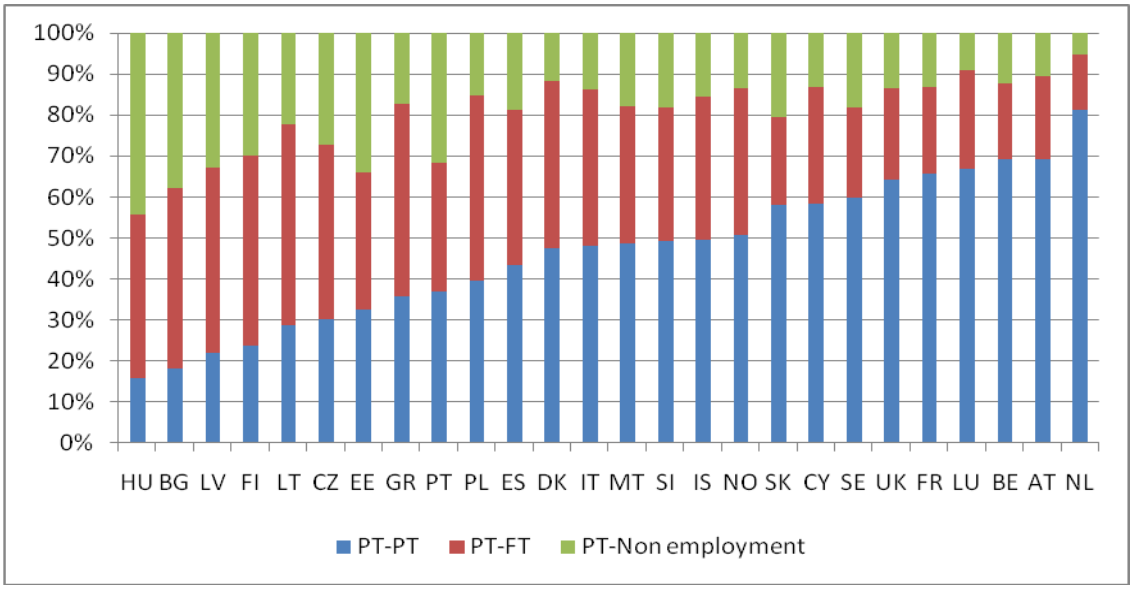
Source: EU-SILC panel 2009, authors' calculations.
Note: Transition rates are calculated in % of people in temporary employment in 2007.

Persistence also characterizes working time regimes in the EU, with 88% of full-timers and 57% of part-timers in 2007 remaining in their initial situation in 2009. However, part-timers are more likely to move towards non-employment than full-timers (14% against 9%). The probability of staying in part-time work is generally higher in countries where part-time jobs are the most developed (like The Netherlands, or the UK), as well as in Austria, France,

[15] Defined here on the basis of self-declaration.

Belgium, and Luxembourg. The probability of becoming unemployed or inactive for part-timers, and thus the vulnerability of that labour market situation, is higher in Bulgaria, Estonia, Finland and Hungary than in the other countries. These are all countries with below average part-time shares.

Figure 7. Transitions from part-time jobs



Source: EU-SILC panel 2009, authors' calculations.

Note: The transition rates are calculated in % of people working part-time in 2007. PT: Part-time employment; FT: Full-time employment.

2.2. Working time[16]

The EU-SILC panel includes information on actual working time which allows us to study the evolution of short and long working hours, both of which can be considered as negative characteristics of a job. The reasons differ in the two cases: short hours usually result in poverty and limited access to some social protection rights; on the other hand, very long hours might be bad for health in the long run, and induce work-family conflicts.

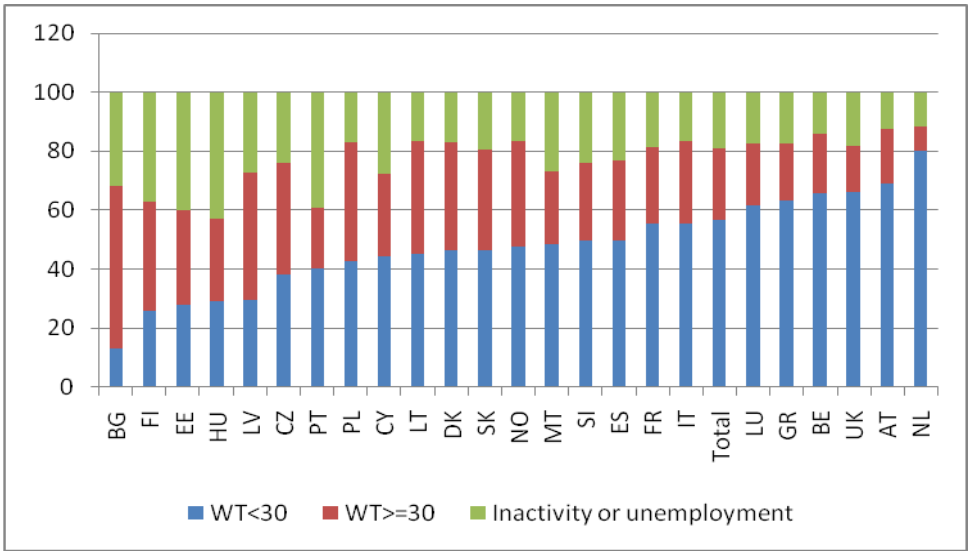
On average, short and long working hours remained stable between 2007 and 2009 (see Figures A5 and A6 in Appendix). For long working time there was a small decrease between 2007 and 2009, whatever the definition used (we tested two definitions of long hours, over 45 hours a week, and over 40 hours a week). France, Belgium and Norway are exceptions to this trend as they experienced slight increases in the share of workers declaring more than 45 hours a week (see Figure A5). The share of very short part-time hours (under 15 hours a week) and short part-time hours (under 30 hours a week) raises very slowly (less than 0.5 percentage point).

This stability may conceal important flows: indeed, short-hours jobs belong to the most unstable and are likely to be sensitive to the economic cycle (temporary agency work, etc.).

[16] Given some problems for 2009 working time data, Sweden has been excluded from this part of the analysis.

Transitions analyses confirm that hypothesis (Figure 8): on average 57% of individuals working less than 30 hours in 2007 were still in that situation in 2009, whereas 24% were working more than 30 hours and 19% were inactive or unemployed. Stability of short working hours is greater in The Netherlands where the share of transitions towards non-employment is also the lowest. This confirms the singularity of the Dutch working time regime. Transitions to non-employment are the highest in Hungary, Portugal, Finland and Estonia.

Figure 8. Transitions of workers with short working time in 2007 (<30h)



Source: EU-SILC panel 2009, authors' calculations.
Note: The transition rates are calculated in % of people with short working time in 2007.

2.3. Occupation

To analyze occupational mobility we use a four-category classification: high-skilled clerical, low-skilled clerical, high-skilled manual, low-skilled manual (Table 2).

Table 2. Occupational mobility, 2007-2009

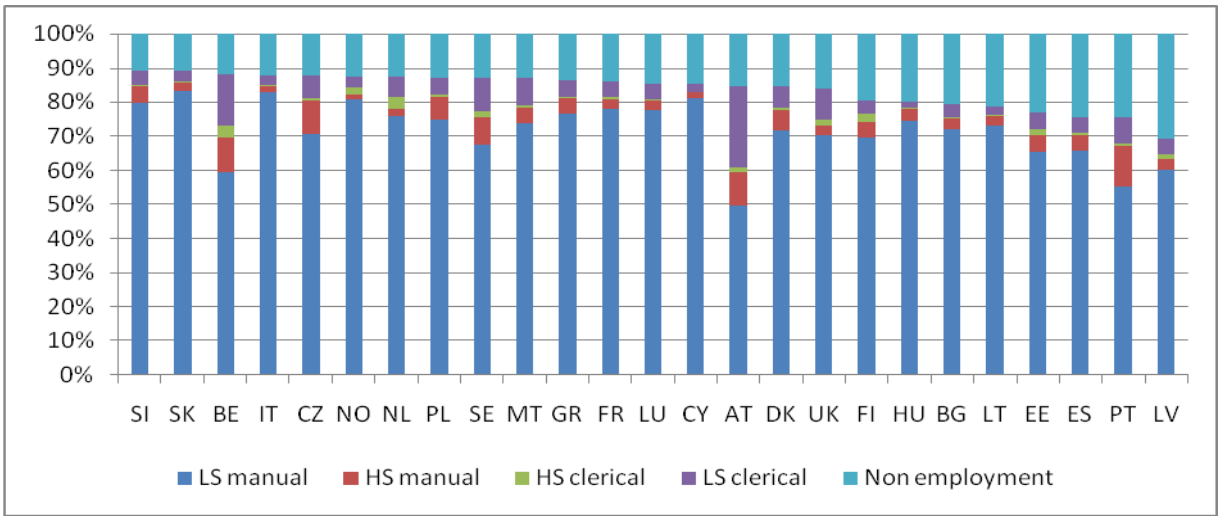
	HS clerical 2009	LS clerical 2009	HS manual 2009	LS manual 2009	Non employment 2009
HS clerical 2007	83.5	7.17	0.97	0.66	7,7
LS clerical 2007	4.84	81.22	1.21	2.23	10,5
HS manual 2007	1.32	3.32	76.12	5.16	14,08
LS manual 2007	0.88	5.31	4.82	72.27	16,72

Source: EU-SILC panel 2009, authors' calculations.
Note: HS: High-skilled; LS: Low-skilled.

Individual positions appear quite stable, although downward mobility or outflow towards non-employment is more frequent for low-skilled and manual occupations: for example, 16% of 2007 low-skilled manual and 14% of high-skilled manual workers were non-employed in 2009, whereas only 7.7% of high-skilled clerical workers and 10% of low-skilled clerical workers were in that situation. The crisis hit more heavily the low-skilled and manual occupations. Such negative transitions have been higher in some countries, like Spain, Estonia, Portugal and Latvia (see Figure 9 for low-skilled manual workers).

Transitions analysis also reveals a persistence of occupational categories for most individuals. Nevertheless occupational mobility seems higher in Belgium, Austria and Sweden.

Figure 9. Transitions of low-skilled manual workers between 2007 and 2009



Source: EU-SILC panel 2009, authors' calculations.

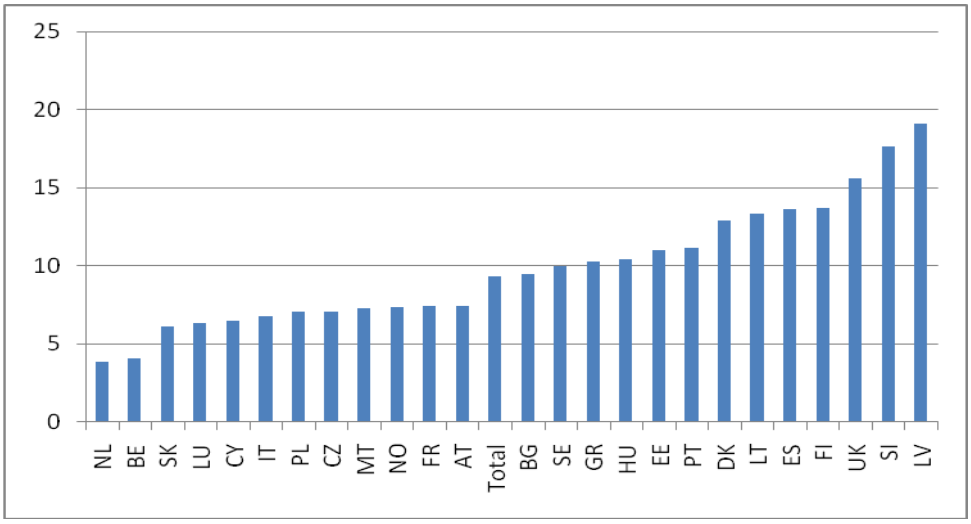
2.4. The crisis and job quality deterioration

According to the JQI evolutions, the crisis has led to a small deterioration in job quality in the EU, and the intensity of this deterioration is related to the importance of the economic shock in the different countries for only some of the JQI dimensions.

To summarize the trends in job quality at the individual level during the crisis, we compute an indicator of job quality deterioration[17]. For all individuals in employment in 2007, we construct an indicator of deteriorating job quality (from 2007 to 2009), which includes the following criteria: either a transition from permanent to temporary job, or a transition from full-time to part-time work, or a change in occupation that can be interpreted as downward mobility (from high-skilled to low-skilled clerical or manual). In our analysis we also consider transitions to non-employment, to account for the effects of job destruction on individual transitions during the crisis.

[17] We focus here on deterioration because of the period studied and the focus on the crisis. Some improvements in job quality may also have taken place in parallel, but this is not the focus of this paper.

Figure 10. Deterioration in individual job quality



Source: EU-SILC panel 2009, authors' calculations

Among countries most affected by individual job quality deterioration, we find Lithuania, Latvia, Slovenia, Spain and the UK in which the recession was severe in 2008. For those in employment in 2007 and 2009, stability in job quality seems higher in The Netherlands, in Belgium, Slovakia, Italy or Poland. While not directly comparable in terms of the criteria used in the JQI, these results do fit with the idea of positive trends in Poland, Belgium, or the Czech Republic, and deterioration in the UK and also Sweden. Two main exceptions appear: the French case, which ranks below the average in terms of job quality deterioration according to individual transition indicators, and the Danish case, that is characterized here by a relatively high share of deterioration in job quality. This can be explained largely by the differences in the indicators used: under the JQI criteria, Denmark is improving and France deteriorating in terms of working conditions and working time and work-life balance[18], criteria which are not included here.

3. THE DETERMINANTS OF JOB QUALITY EVOLUTION AT THE INDIVIDUAL LEVEL

In this part of the analysis, we focus on individuals' transitions over the 2007-2009 period. We analyze the factors influencing the probability of experiencing a decreasing trend in job quality from 2007 to 2009 (for individuals employed in 2007), as defined above. Given the importance of job destruction and transitions to non-employment (whether inactivity or unemployment) during a recession, we also take into account transitions to non-employment. Job quality evolution at the individual level is therefore assessed by using multi-level multinomial logit models to account for both individual factors and country characteristics. This approach gives a complementary insight on the evolution of job quality in the crisis since it allows variations in job quality at the individual level to be taken into account. It thereby accounts for possible compensation effects over the population, especially if there

[18] It should be recalled that the JQ sub-index on working time and work-life balance includes information on excessive and atypical working time (inverted) as well as voluntary part-time and subjective work-life balance.

have been divergent evolutions across socio-demographic groups. For instance, a stable overall trend in job quality in a given country may in fact conceal a two-way trend of deterioration for some individuals and improvement for others.

3.1. Using multi-level models to explain the evolution of job quality at the individual level over the crisis

Multi-level models have been the subject of renewed interest since the development of large international databases, hand-in-hand with the growth of computing power and software availability[19]. These models are useful when individuals are 'nested' into higher level structures. In our study, individuals are 'nested' in countries, each country being characterized by specific national institutions but also by specific economic trends (especially in the crisis). Multi-level models offer an interesting framework enabling both individual and contextual determinants of an observed event to be taken into account. They differ from more traditional techniques such as fixed effects regressions mainly because their goal is not to 'cure' regressions of contextual effects, but to interpret and compare these effects. The study of differences between groups is here of primary interest, whereas under the standard approach it tends rather to be considered as a nuisance requiring correction but otherwise of no inherent interest.

Multi-level models are used here since we assume that the evolution of job quality measured at the micro level is likely to be explained by both individual and institutional/country characteristics. As mentioned before, the dependent variable in our model can take three values. In a multinomial logit model, a reference state should be defined. In all regressions presented below, the reference state is *'employed in 2009 with no decrease in job quality compared to 2007'* (*i.e.* JQ can be the same or higher). In each model, there are two sets of equations: a first set representing the log odds of being out of employment relative to being in employment with no decrease in job quality compared to 2007 (log [P(1)/P(3)]), a second set representing the log odds of being in employment with a lower JQ than in 2007 relative to being in employment with no decrease in job quality compared to 2007 (log [P(2)/P(3)]).

The methodology proceeds in different steps that are summarized below and extensively presented in Appendix 3. First, we estimate an 'empty' or 'unconditional' model that only includes a random intercept. This empty model delivers a picture of countries' relative situation in terms of job quality evolution measured at the individual level between 2007 and 2009. In a second step, individual variables are introduced to estimate the influence of individual characteristics on job quality evolution. In a third step, several models are tested where contextual variables are introduced to see how the national context and institutions affect the individual probability of experiencing a transition out of employment or a decrease in job quality. Finally, in a last step, we concentrate on the effect of contextual variables on some specific socio-demographic groups (women, youth, older workers and low-educated workers) by making some institutional level-2 variables interact with these individual variables.

3.2. Relative position of countries

The estimation of multi-level models requires the availability of both contextual and individual data for all the countries that are introduced into the analysis. Therefore our

[19] For labour market issues important developments have taken place over the last years: see for instance Holm *et al.*, 2010; Steiber and Haas, 2009; van der Lippe *et al.*, 2010.

sample is restricted to twenty countries for which both EU-SILC panel and institutional or sector data are available[20]. It is composed of 57,149 individuals.

As shown by the results of the empty model (Table 3), on average in the twenty European countries considered here, people who were employed in 2007 are less likely to be out of employment in 2009 than to be employed with an equal or higher JQ. They are also less likely to be employed with a lower JQ in 2009 than to be employed with an equal or higher JQ.

Table 3. Results of the empty model

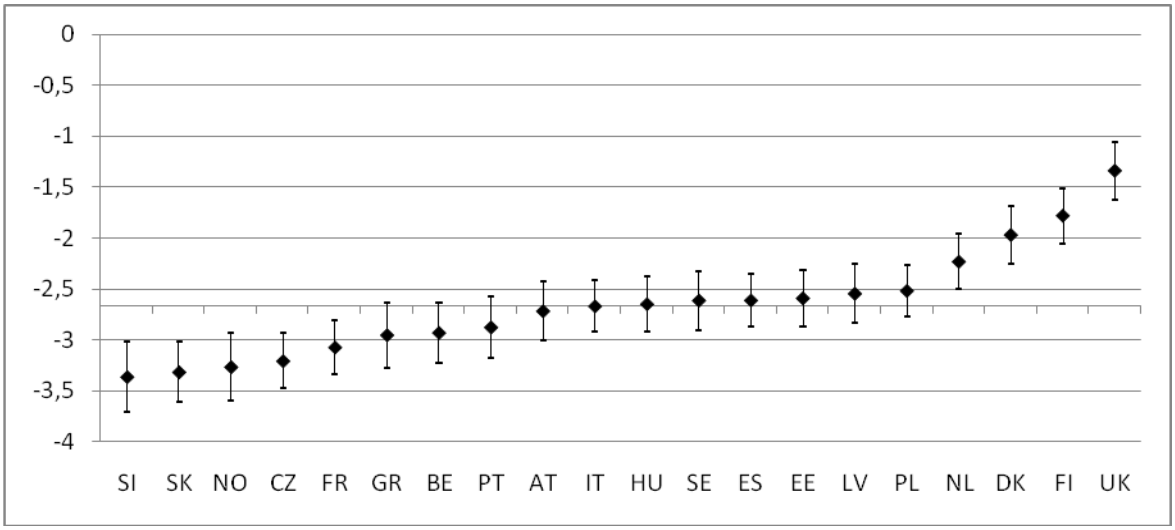
	Model 1 = empty model	
	Non-employment *vs* no deterioration in JQ	Deterioration in JQ *vs* no deterioration in JQ
Intercept	-2.661***	-2.196***
Variance of the intercept	0.27951	0.25353

Source: EU-SILC individual data (longitudinal database from 2007 to 2009). 57149 individuals aged 15 to 64; 20 countries.

However, these probabilities vary across countries as shown by the country-specific effects presented in Figure 11. The two average log odds ($\gamma_{00(1)}$ and $\gamma_{00(2)}$) are represented by a horizontal line at their respective level (-2.661 on the first graph and -2.196 on the second one) and country-specific effects are presented with their 95% confidence interval.

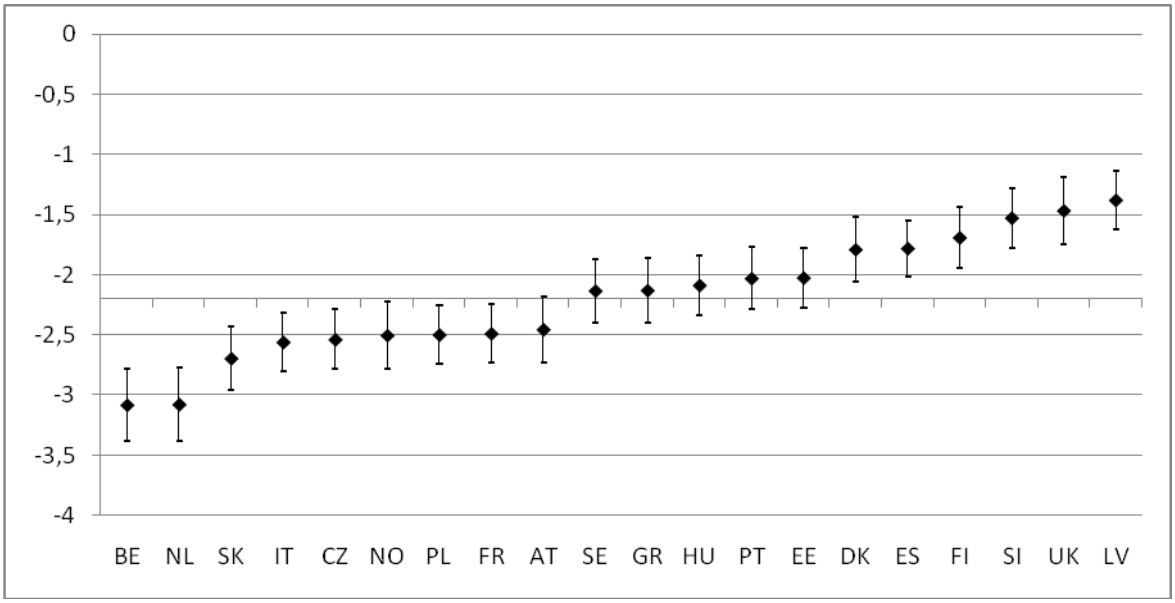
Figure 11. Box plot of level-2 residuals (i.e. country-specific effects)

11.a: Not employed vs JQ staying the same or improving



[20] Compared to the previous section where 24 countries were analyzed, Bulgaria, Cyprus, Malta and Luxembourg are missing in this section.

11.b: JQ deteriorating vs JQ staying the same or improving



In some countries such as the UK, Denmark, Finland, Latvia, Estonia and Spain, both country-specific effects are higher (*i.e.* less negative here). This means that individuals in these countries are relatively more likely than in other European countries to move to non-employment or to experience a decrease in JQ (relative in both cases, to being employed with an equal or higher JQ). On the contrary, in Slovakia, Norway, the Czech Republic and Belgium, individuals have on average the lowest probabilities in Europe of experiencing a downward trend in JQ or a transition to non-employment. Although this is a quite raw comparison insofar as it does not account for the distribution of socio-demographic characteristics, it can still be shown to link up with the differences in crisis intensity across European countries: between 2007 and 2009 the drop in GDP was much greater in the first group of countries (especially in Latvia and Estonia but also in Denmark, Finland and the UK) than in the second group where GDP decreased by no more than two percentage points over this period (see Figure A1 in Appendix).

Some countries exhibit more nuanced profiles. For instance, The Netherlands and Poland are characterized by a relatively higher probability of transition to non-employment compared to other European countries (relative to employment with an equal or higher JQ) but a relatively lower probability of transition to employment with lower JQ (again relative to employment with an equal or higher JQ). Recalling that Poland was the country with the largest overall improvement in aggregate JQ (Section 1), it is interesting to point out that this finding is, however, associated with higher individual probabilities of moving out of employment which can be explained by rather flexible employment protection legislation, Poland now being the country with the highest share of fixed-term contracts in Europe.

Inversely, the individual probability of moving to non-employment is lowest in Slovenia (relative to employment with no deterioration in JQ), whereas the probability of transition to employment with lower JQ is relatively higher than in other European countries. An explanation for this finding is that internal flexibility was strongly encouraged in Slovenia during the crisis[21].

[21] See http://www.eurofound.europa.eu/ewco/studies/tn1203015s/si1203011q.htm for more details.

3.3. Individual determinants of job quality evolution

Looking at individual factors influencing job quality evolution from 2007 to 2009, it appears that most of these determinants have a similar effect on the probability of being out of employment or of experiencing a decrease in job quality (relative to experiencing no deterioration in JQ in both cases). The only exception concerns the effect of gender: being a woman increases the probability of moving towards non-employment and decreases the probability of experiencing a downward trend in JQ. In this regard, it is important to mention that, due to sector segregation, women's jobs were on average less affected by the economic crisis, particularly during the first period.

Table 4. Role of individual characteristics on JQ evolution between 2007 and 2009

Model 2	**Not employed** *vs* JQ staying the same or improving		**JQ deteriorating** *vs* JQ staying the same or improving	
Intercept	-2.953342	<0.001	-2.493706	<0.001
Child<16 years	-0.059521	0.208	-0.344708	<0.001
Child<3 years	0.981222	<0.001	0.128251	0.299
Unemployed in 2008	2.372222	<0.001	2.741245	<0.001
Youth (15-24)	1.080972	<0.001	0.538224	<0.001
Older worker (55-64)	1.528007	<0.001	1.814547	<0.001
ISCED 0-2	0.593920	<0.001	0.414830	<0.001
ISCED 5-6	-0.467252	<0.001	-0.502156	<0.001
Woman	1.032162	<0.001	-0.203576	<0.001

Source: EU-SILC individual data (longitudinal database from 2007 to 2009). 57149 individuals aged 15 to 64; 20 countries.

Youth and older workers have, on average, a higher probability of experiencing a transition out of employment or a downward trend in JQ between 2007 and 2009 (relative to being in employment with an equal or higher JQ) compared to middle-aged individuals.

A higher level of initial education seems to prevent individuals from experiencing bad transitions since low-educated individuals are more likely and high-educated people less likely to move to non-employment or to a lower quality job (relative to moving to employment with an equal or higher JQ).

Individuals who had a child between 2007 and 2009 are more likely to move out of employment. This can probably be related to women's transitions to inactivity to care for their very young child. The effect of childbirth on job quality deterioration is positive but not significant. On the contrary, the presence of older children (up to 16 years) is negatively related to the individual probability of experiencing a decrease in job quality. This could be explained by the fact that parents with children still living at home generally choose 'safer' jobs.

A dummy variable that identifies individuals who were unemployed in 2008 is also introduced in the regression. As expected, these people are more likely to be unemployed or inactive in 2009 (relative to being in employment with an equal or higher JQ) but they are also more likely to experience a decrease in job quality in comparison to their job in 2007. This result can be linked to the fact that unemployed people are likely to accept lower quality

jobs (by, for example, moving to a temporary job, a part-time job or a lower-skilled job) in particular in times of crisis.

3.4. Contextual determinants of job quality evolution over the 2007-2009 period

As explained above, in a further step a number of contextual variables are introduced into the equation of the intercept to establish whether inter-country variations can partly be explained by institutional or cyclical variables (see Appendix 3 for more details on methodological issues). Various contextual variables are introduced into the model. All contextual variables have first been introduced one by one into the intercept equations. The most significant ones have then been introduced simultaneously into these equations. The final step consists in the interaction of a number of contextual variables and some individual variables. In particular, we have crossed interacted gender, age and education variables with some contextual variables.

All steps are presented in Table A3 in the Appendix and comments refer mainly to the last model.

Model 7 shows that stronger employment protection legislation (EPL)[22] is correlated to lower individual probabilities of moving to non-employment (relative to being in employment with an equal or higher JQ). Strict EPL clearly prevents individuals from transiting out of employment, especially in times of crisis. Countries where employment legislation is more flexible are characterized by more frequent transitions to unemployment or inactivity. Quite intuitively, EPL does not seem to have any impact on the probability of JQ deterioration.

The effect of labour market policy (LMP) expenditure per unemployed person is weak but slightly negative on the probability of experiencing a decrease in JQ, whereas it has no effect on the probability of moving out of employment.

The difference between the unemployment rate in 2009 and the unemployment rate in 2007, taken as a measure of cyclical variations in European countries, is positively correlated to the probability of moving to non-employment and of experiencing a decrease in JQ (relative to being in employment with an equal or higher JQ in both cases) when this variable is introduced alone in the model (model 5). This result indicates that the macroeconomic situation of a given country is of relevance in explaining job quality evolution at the individual level. This can be directly linked to our result from the first section concerning the relationship between macroeconomic performance and the 'non-standard employment' dimension of job quality. As our measure of JQ in the present section builds mainly on indicators of non-standard employment (transition to part-time or to temporary employment), the positive correlation between difference in unemployment rates and job quality deterioration rather confirms the hypothesis of complementarities between the quantity and quality of jobs. Nevertheless, this effect becomes insignificant when sector variables are crossed with individual variables (suggesting that sector variables also capture differences in macroeconomic and labour market shock across countries).

Indeed, model 7 (which is the best model according to variance analysis) shows that the introduction of an interaction between the individual variable 'woman' and the contextual variable on the share of tertiary employment better explains the evolution of JQ over the

[22] We consider here overall EPL.

period. It appears that the share of tertiary employment is negatively correlated to the probability of a decrease in job quality. In other words, in countries where the share of tertiary employment is high, women are less likely to experience a decrease in their job quality[23]. Interactions between age and policy variables give no significant results; nor do interactions of the low-education variable '*ISCED 0-2*' with some other contextual sector variables (share of construction, in particular).

Table 4. Results of the 'best' model (i.e. model 7)

	Not employed *vs* JQ staying the same or improving		**JQ deteriorating** *vs* JQ staying the same or improving	
Intercept	-2.975660	<0.001	-2.512257	<0.001
Contextual variables				
EPL	-0.547806	0.002	0.006920	0.963
EXP_UNEMPL	0.000004	0.529	-0.000010	0.074
UNEMPL_DIFF	0.038919	0.202	0.048620	0.111
Individual variables				
Child16	-0.057919	0.221	-0.342454	<0.001
Child2	0.966191	<0.001	0.121064	0.328
Unemploy08	2.365076	<0.001	2.752196	<0.001
Age15-24	1.077157	<0.001	0.543819	<0.001
Age55-64	1.533097	<0.001	1.830460	<0.001
ISCED 0-2	0.594540	<0.001	0.406714	<0.001
ISCED 5-6	-0.455513	<0.001	-0.498747	<0.001
Woman	1.066194	<0.001	-0.269919	0.004
TERTIARY (cross-level)	-0.003500	0.831	-0.026035	0.028

Source: EU-SILC individual data (longitudinal database from 2007 to 2009) and aggregated data from Eurostat and OECD. 57149 individuals aged 15 to 64; 20 countries.

To conclude, this analysis of job quality evolution from a micro perspective confirms the heterogeneity of job quality across countries and across sub-populations and shows that both cyclical and institutional variables play a role in explaining job quality trends.

Some socio-economic groups are more affected by decreasing trends in job quality (other things being equal), especially youth, older workers and low-educated workers. Women seem less affected by these negative trends than men but are more likely than men to move to non-employment over the period. This trend has also been shown in previous transition analysis unrelated to the economic crisis. Parenthood has ambiguous effects on labour market transitions and JQ evolution: the birth of a child during the recession is correlated with a higher probability of moving to non-employment while the presence of older children (up to 16) is correlated with a lower probability of experiencing a decreasing trend in JQ that may reflect a selection of parents into safer jobs.

[23]This might be a short-term impact. Austerity policies are likely to have negative effects on women's employment in the longer run.

Heterogeneity between countries in terms of job quality is confirmed when analysing the evolution of JQ over the period. This heterogeneity can be related to economic trends (unemployment variation) and, to a minor extent, to shares of employment in different economic sectors. Some labour market institutions also seem to play a role in explaining the evolution of JQ in times of crisis: EPL prevents individual transitions to non-employment (and has no direct effect on JQ) while public expenditure per unemployed slightly reduces the risk of JQ deterioration.

CONCLUSIONS

Empirical analysis of job quality trends reveals some deterioration of job quality between 2005 and 2010 which can be observed both at the aggregate level through the JQI index and at the individual level through downward transitions between 2007 and 2009.

This deterioration seems to be related to the intensity of the shock experienced by the different countries, especially over the 2007-2009 period and for the non-standard employment dimension of job quality. But it appears less clear over a five-year period in which job quality trends may also be driven by other factors, like the sectoral composition of employment and labour market policies. For instance, the deterioration of the JQI in France between 2005 and 2010 cannot be fully explained by cyclical factors and calls for other explanations. Indeed, if the rise of involuntary temporary employment or the negative perceptions of career advancement prospects might be related to the crisis, the increase in longer working hours and the deterioration in the relationship between working time and work-life balance might rather be related to labour market policies, and more precisely to the introduction of financial incentives for overtime hours in 2007. The intensification of work appears to be the prolongation of a structural trend (Askénazy *et al*, 2006), as well as the result of diminishing collective representation.

Cross-country heterogeneity is significant in Europe in terms of job quality. The relative position of countries has not changed in any major way, despite a marked improvement in Poland, which had the lowest level of job quality in 2005, according to the JQI. Differences across countries appear related to a number of labour market institutions and policies and not only to unemployment variations. Over the period 2007-2009, public expenditure per unemployed person slightly reduces the risk of job quality deterioration, whereas employment protection legislation has no direct impact.

Individual factors also matter: youth, older workers and low-educated workers tend to be more likely to experience decreasing job quality during the crisis. Gender differences are less clear: at the aggregate level (JQI) women experience better working conditions and less atypical working time, but they are more affected by involuntary non-standard employment and receive, on average, lower wages. In a dynamic perspective, they tend to be more hit by non-employment than by decreases in job quality, and seem to be relatively more 'protected' – at least during the first period of the crisis which is the focus of our analysis – in countries where the share of the tertiary sector is higher.

This paper shows the relevance of the job quality perspective on labour market trends, as a complement to a more quantitative perspective on unemployment or employment performance. But it has a number of limitations: the observation period is rather short and there might be some lags in the labour market impacts of the crisis; individual variables of job quality in the currently available European panel data are relatively scarce and a number

of relevant countries such as Germany and Ireland can currently not be included in the analysis due to data deficiencies. At the aggregate level, important sub-dimensions of job quality such as working conditions are only available in five-year intervals, limiting the possibilities of clearly linking the observed trends in job quality to the crisis. This calls for further research using EU-SILC data for 2010 but also national panel data in order to extend the set of variables considered in a dynamic perspective.

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DATA SOURCES

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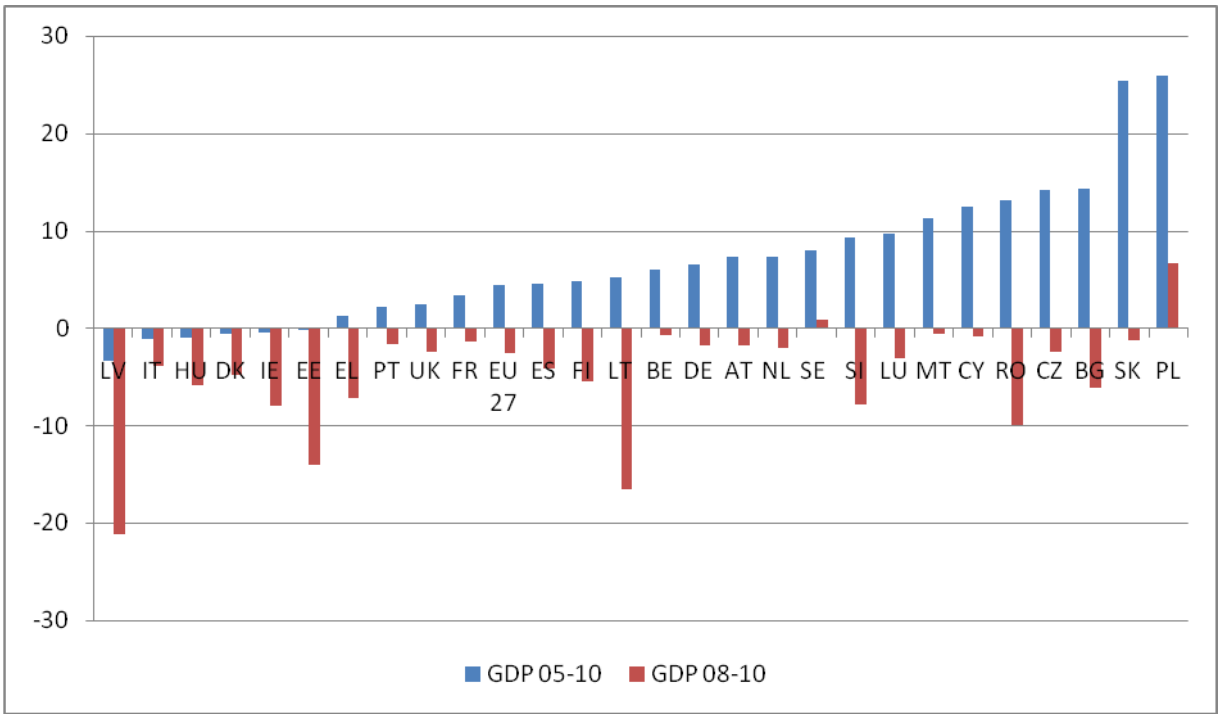
APPENDICES

Appendix 1

Figure A1. GDP variation 2005-2010 and 2008-2010



Source: *National Accounts*, Eurostat.

Methodology: The JQI

The six sub-indices of the JQI are chosen to reflect the issues that – according to the relevant literature – affect workers' perception of whether or not they hold a 'good job'. The focus of the JQI is on the employment relationship itself, so that the index excludes wider welfare state issues and indicators of quantitative labour market performance (in contrast to the Laeken indicators, for example). On the other hand, data limitations necessarily curtailed the choice of sub-indices and limited the indicators used therein, although the inclusion of additional indicators would have been desirable. Between 2005 and 2010 a number of new relevant variables have become available. Leschke, Watt and Finn (2012, section 5) discuss some alternative specifications on, for example, wages and working time and work-life balance and how these would affect the country rankings on the JQI.

Each of these six sub-dimensions is composed of at least two and a maximum of four indicators (some of which are themselves composites). An overview of the sub-indices and their indicators, the data sources as well as the weightings used, is given below in Table A1.

While the approach to constructing the European JQI, based on the six sub-indices, enables us to take an encompassing view of this multi-dimensional phenomenon, this approach raises, at the same time, a number of methodological issues in arriving at an overall JQI: First of all, in order to permit composition, the data for each indicator have to be normalised. This is done by setting a maximum value (at the value of the best performer) and a minimum value (at the value of the worst performer) for each indicator. On this basis, a value can be assigned to each country, for each indicator, in the range between zero and one. Higher values represent relatively higher levels of job quality for the indicator in question. In order to be able to compare the results for men and women, the maxima and minima 'total' figures for the relevant variable are used to normalise the male and female data. For the comparison over time, 2005 is chosen as the base year. This is done separately for the total, male and female figures, *i.e*. unlike in the cross-sectional comparison, for the comparison over time the maxima and minima for each population group in 2005 is used to normalise the data for that group for 2010.

In order to address the issue of weighting, the following 'mixed' approach has been adopted. No attempt is made to weigh the six different sub-indices of the JQI. A country's JQI is the sum of its scores on these sub-indices divided by six (the number of sub-indices). We emphasise the findings for the six sub-indices rather than the overall JQI, not least because results differ, in some cases appreciably, between the indices as well as between men and women. At the same time, the contributions of the two, three or four different indicators to each sub-index are weighted. For instance, the two components of the first sub-index ('real wages' and 'in-work poverty') are weighted 0.7 and 0.3 respectively. This introduces an element of subjectivity, but one that appears manageable because it is the relative importance of a limited number of indicators contributing to one particular aspect of job quality (and thus likely to be rather similar in nature) (for more details on the method and plausibility testing of weighting within sub-indices, see Leschke, Watt and Finn [2008]).

Table A1. Sub-indices and their indicators* in the Job Quality Index: 2005 and 2010

Sub-indices	Indicators	Data source	Weighting
Wages	Nominal compensation per employee in PPS deflated using CPI; gender figures estimated using gender pay gap	AMECO/ Eurostat	70
	In-work poverty (those individuals who are classified as employed whose household equivalized disposable income is below 60% of the national median equivalized income)	Eurostat	30
Non-standard forms of employment	Temporary employment[a] as share of total number of employees*share of temps indicating that main reason was that they could not find permanent job	Eurostat, LFS	50
	Part-time employment as share of total number of employees* share of part-timers indicating that main reason was that they could not find full-time job	Eurostat, LFS	50
Working time and work-life balance	Share of employees working more than 48 hours a week	Eurostat, LFS, customized tables	25
	Average of share of workers on shift work; Saturday work; Sunday work; night work; evening work	Eurostat, LFS	25

	Voluntary part-time work (share of people working less than 30 hours who state as reason that they do not want to work more hours)	EU-SILC	25
	'Working hours fit in with family/social commitment'	EWCS	25
Working conditions and job security	'Work intensity' (working at a very high speed, working to tight deadlines and not having enough time to get the job done)	EWCS	25
	'Work autonomy' (can choose/change order of tasks, methods of work, speed of work, can take a break when you wish)	EWCS	25
	'Physical work factors' (vibrations, noise, high/low temperature, breathing in smoke, fumes, powder, dust, vapours such as solvents and thinners, handling chemical substances, radiation[b], tobacco smoke from other people, infectious materials, tiring or painful positions, lifting or moving people, carrying or moving heavy loads, standing or walking, repetitive hand or arm movements)	EWCS	25
	'I might lose my job in the next six months'	EWCS	25
Skills and career development	share of population (25-64 years) participating in education/training over four week prior to survey	Eurostat, LFS	60
	'My job offers good prospects for career advancement'	EWCS	40
Collective interest representation	Collective bargaining coverage	ICTWSS database[c]	40 (2005) 60 (2010)
	Trade union density	ICTWSS database	30 (2005) 40 (2010)
	Consulted about changes in work organisation[d]	EWCS	30 (2005) - (2010)

Note: Information on response categories and the coding of variables can be found in Leschke, Watt, Finn 2008, p. 18f.

a The LFS data on temporary employment refers to all contracts of fixed duration. This encompasses also temporary agency work as long as there is no permanent contract with the agency.

b included in 2005, no longer available in 2010 data.

[c]for 2005 supplemented by national reports/expert opinions.

[d]included in 2005, no longer available in 2010 data, for time comparison the 2005 sub-index has been recalculated without this indicator.

Country abbreviations:

AT: Austria	IT: Italy
BE: Belgium	LT: Lithuania
BG: Bulgaria	LU: Luxembourg
CY: Cyprus	LV: Latvia
CZ: Czech Republic	MT: Malta
DE: Germany	NL: Netherlands
DK: Denmark	NO: Norway
EE: Estonia	PL: Poland

ES: Spain	PT: Portugal
FI: Finland	RO: Romania
FR: France	SE: Sweden
GR: Greece	SI: Slovenia
HU: Hungary	SK: Slovakia
IE: Ireland	UK: United Kingdom

Figure A2. Sub-indices and overall JQI for EU27 by gender, 2010[24]

Source: own calculations.

Table A2. Absolute changes between 2005 and 2010 in sub-indices and overall JQI (sorted by country)

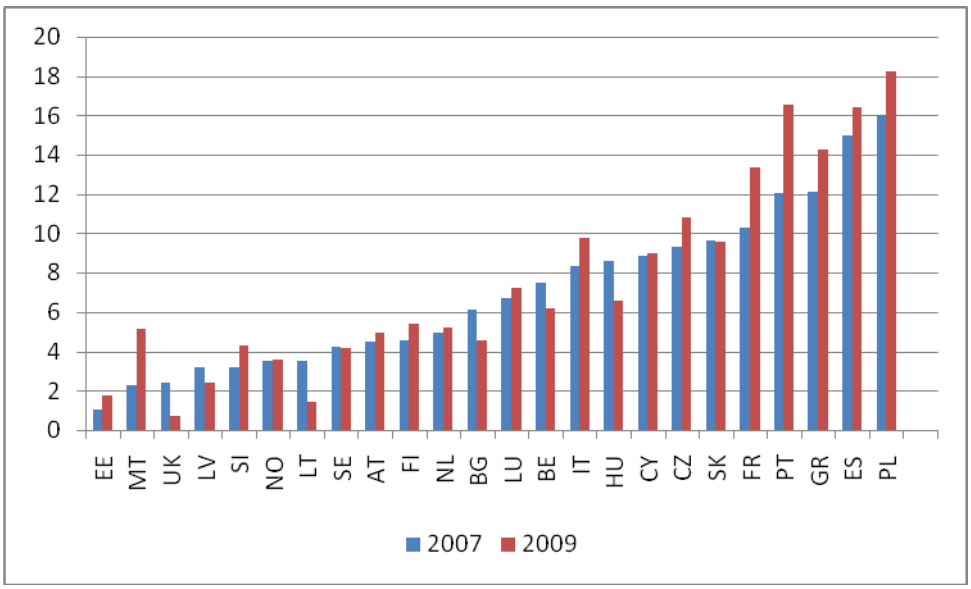
	Wages	Involuntary non-standard (inv.)	Working time and WLB	Working conditions and job security	Skills and career develop-ment	Collective interest representa-tion	Total JQI - adjusted
Austria	0.03	-0.01	0.02	0.02	-0.10	-0.03	-0.01
Belgium	-0.04	0.07	0.10	-0.05	0.11	0.00	0.04
Bulgaria	0.00	0.01	0.12	-0.02	0.05	-0.06	0.02
Cyprus	0.01	-0.04	-0.02	-0.06	0.13	-0.07	0.00
Czech Republic	-0.01	-0.02	0.04	0.18	0.09	-0.07	0.04
Denmark	-0.02	-0.03	0.11	0.11	0.08	0.00	0.04
Estonia	0.02	-0.07	-0.02	-0.03	0.12	-0.12	-0.01
EU15	-0.04	-0.08	0.00	0.00	-0.04	-0.02	-0.03
EU27	-0.04	-0.06	0.04	0.02	-0.01	-0.02	-0.01
Finland	0.03	0.03	0.05	0.13	-0.05	-0.01	0.02

[24]In order to evaluate changes over time correctly the 2010 outcomes have to be based on the 2005 values for, respectively, men and women. However, this makes it hard to analyze differences between men and women in a single year. This figure is based on the 2010 outcomes by gender and, conversely, should not be used to evaluate trends over time.

France	-0.04	0.00	-0.08	-0.14	-0.12	-0.04	-0.08
Germany	-0.19	0.02	-0.04	0.15	-0.04	-0.02	-0.02
Greece	-0.07	-0.11	-0.02	0.06	0.06	-0.02	0.00
Hungary	0.01	-0.13	0.13	0.01	0.04	-0.02	0.01
Ireland	0.06	-0.55	0.09	-0.29	0.03	-0.07	-0.11
Italy	0.01	-0.23	0.05	-0.05	0.02	0.00	-0.02
Latvia	0.04	-0.16	0.21	0.00	-0.01	0.02	0.01
Lithuania	0.01	0.07	0.05	0.02	-0.10	-0.04	-0.01
Luxembourg	-0.05	0.02	0.07	-0.14	0.22	-0.05	0.02
Malta	0.00	-0.02	0.08	0.06	0.09	-0.03	0.03
Netherlands	-0.04	0.01	0.10	0.05	-0.03	-0.03	0.00
Poland	0.06	0.10	0.27	0.17	0.18	0.01	0.13
Portugal	-0.01	-0.12	0.03	0.17	-0.04	-0.13	-0.03
Romania	-0.31	-0.03	0.30	0.06	0.03	0.02	0.02
Slovakia	0.05	-0.07	0.15	0.02	0.00	-0.14	0.01
Slovenia	-0.04	-0.03	0.05	0.06	0.04	-0.07	0.01
Spain	0.01	-0.11	0.00	0.04	0.01	0.02	-0.01
Sweden	0.02	-0.06	0.07	-0.09	-0.11	-0.05	-0.05
United Kingdom	0.03	-0.19	-0.01	-0.07	-0.08	-0.01	-0.06

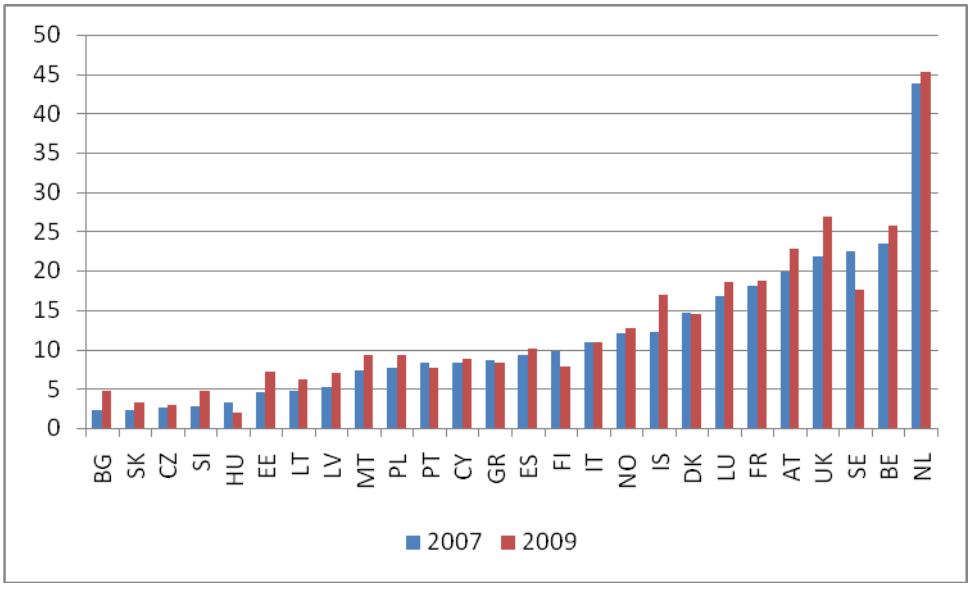
Appendix 2. Descriptive statistics at the country level for job quality variables derived from EU-SILC (2007, 2009)

Figure A3. Share of temporary employment among the employed (%), 2007 and 2009



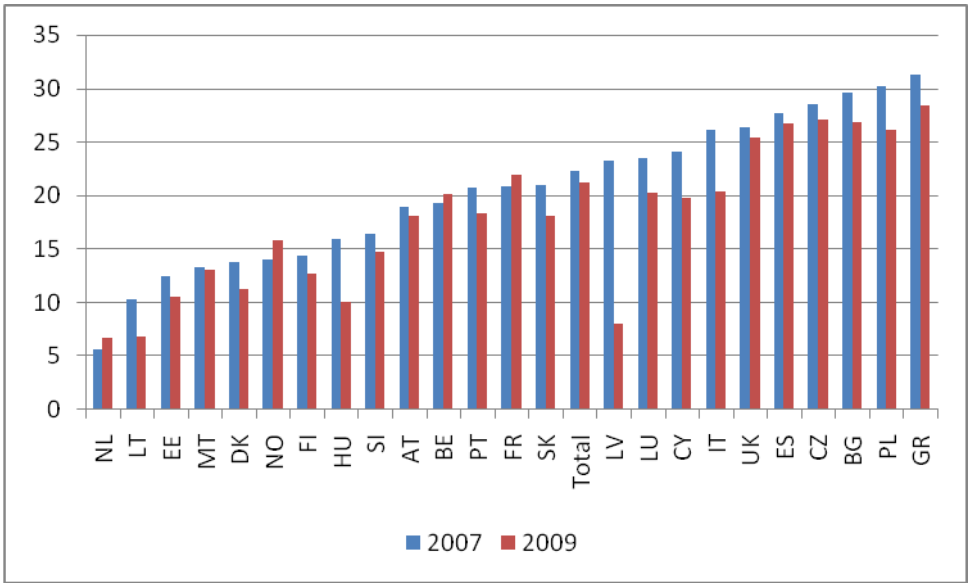
Source: EU-SILC panel 2009, authors' calculations.

Figure A4. Share of part-time employment among the employed (%), 2007 and 2009



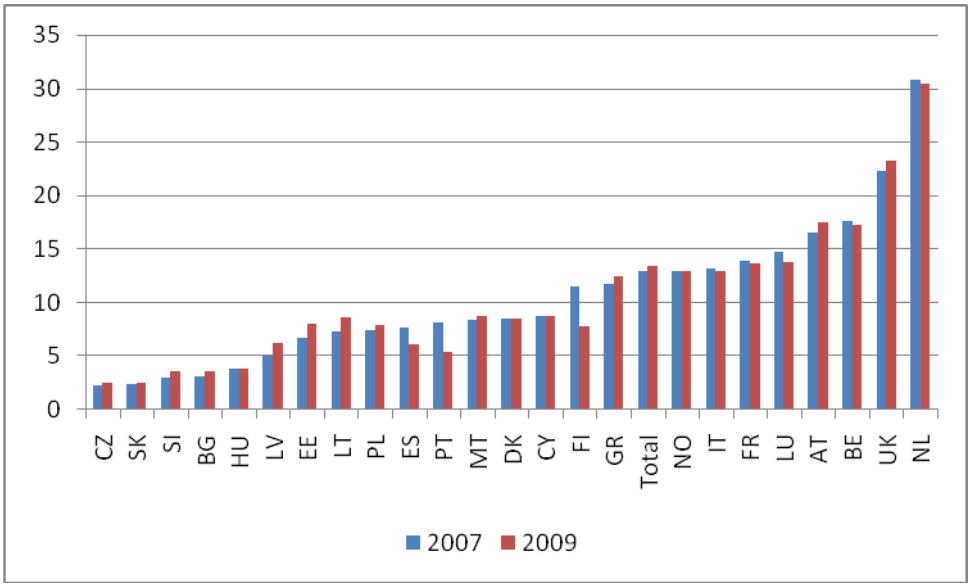
Source: EU-SILC panel 2009, authors' calculations.

Figure A5. Share of long working hours among the employed (>45h, %), 2007 and 2009



Source: EU-SILC panel 2009, authors' calculations.

Figure A6. Share of short working hours among the employed (<30h, %), 2007 and 2009



Source: EU-SILC panel 2009, authors' calculations.

Appendix 3

Methodological issues on multi-level models

In standard (linear or non-linear) regressions, one of the main hypotheses is that individuals in the sample are independent. By contrast, if we assume that individuals are influenced by their national institutional and economic context, this hypothesis no longer holds. The two main ways traditionally used to account for country heterogeneity consist in either running a regression for each country or including dummy variables in the global regression. However, these two options have some drawbacks: calculating models for each 'group' (class, country, etc.) is not only a lengthy process but also makes the overall interpretation rather difficult, while the introduction of dummies relies on the hypothesis that the 'country effect' is the same for all individuals. Multi-level models are thus an interesting alternative methodology that aims at accounting for both individual and contextual effects.

As regards the methodology we proceed as follows:

First, we estimate an 'empty' or 'unconditional' model that includes only a random intercept. The intercept is composed of two parts:

- one being the average expected log-odds of being out of employment relative to being in employment with an equal or higher JQ than in 2007 (respectively the average expected log odds of being in employment with a lower JQ than in 2007 relative to being in employment with an equal or higher JQ than in 2007);

- the other, a country-specific effect.

Thus, in the intercept model, the log odds are the following:

$$\log\left[\frac{P(1)}{P(3)}\right] = \beta_{oj(1)} = \gamma_{00(1)} + u_{0j(1)} \quad (1)$$

$$\log\left[\frac{P(2)}{P(3)}\right] = \beta_{oj(2)} = \gamma_{00(2)} + u_{0j(2)} \quad (2)$$

Country-specific effects of the empty model give a first picture of the position of countries in terms of job quality evolution between 2007 and 2009.

In a second step, the model includes a random intercept as well as individual variables to estimate the influence of individual characteristics on individual job quality evolution. This model shows how variables – such as gender, age (15-24, 25-54, 55-64 years), level of education (according to ISCED classification), parenthood (child under 16, child under 2) but also having experienced unemployment in 2008 – influence the evolution of job quality at the individual level between 2007 and 2009. The intercept is random, as in the empty model, but coefficients for individual variables are supposed to be the same across countries and are estimated over the whole sample:

$$\log\left[\frac{P(1)}{P(3)}\right] = \beta_{oj(1)} + \beta_{1(1)}woman + \beta_{2(1)}age15/24 + \beta_{3(1)}age55/64 + \beta_{4(1)}ISCED0/2 + \beta_{5(1)}ISCED5/6 + \beta_{6(1)}child16 + \beta_{7(1)}child2 + \beta_{8(1)}unempl2008 \quad (3)$$

Where $\beta_{oj(1)} = \gamma_{00(1)} + u_{0j(1)}$ (4)

$$\log\left[\frac{P(2)}{P(3)}\right] = \beta_{oj(2)} + \beta_{1(2)}woman + \beta_{2(2)}age15/24 + \beta_{3(2)}age55/64 + \beta_{4(2)}ISCED0/2 + \beta_{5(2)}ISCED5/6 + \beta_{6(2)}child16 + \beta_{7(2)}child2 + \beta_{8(2)}unempl2008 \quad (5)$$

Where $\beta_{oj(2)} = \gamma_{00(2)} + u_{0j(2)}$ (6)

In a third step, several models are tested where contextual variables are introduced to see how national contexts and institutions affect the individual probability of experiencing a transition out of employment or a decrease in job quality. In this case, intercept equations include what are called 'level-2 variables' that are national averages of variables which are likely to influence job quality evolution. Here we thus carry out a complementary analysis – at the individual level – of the effect of economic trends on job quality that was studied at the aggregate level in the first section of this article. It also allows testing the influence of a number of institutional variables.

Among macro-economic variables that are likely to influence job quality evolution, we have tested the effect of a number of institutional variables related to the labour market (Employment Protection Legislation, total labour market policy expenditures per unemployed, active labour market policy (ALMP) expenditures per unemployed, passive LMP expenditures per unemployed, rates of variation in these expenditures), but also some sector variables (share of employment in agriculture, industry, construction and tertiary sector) and cyclical variables (unemployment rate in 2007, unemployment rate in 2009, GDP variation, unemployment rates difference)[25]. The significance of coefficients, as well as level-2 covariances, were compared in order to choose the most meaningful models. Introducing macro-variables allows the global influence of some contextual features to be grasped simultaneously with individual effects. In this step, models are composed of equations (3) and (5) and of the two following intercept equations (model 6 from Table A3 is taken as example):

$$\beta_{oj(1)} = \gamma_{00(1)} + \gamma_{01(1)}unempl\_diff + \gamma_{02(1)}EPL + \gamma_{03(1)}exp\_unempl + u_{0j(1)} \quad (7)$$

$$\beta_{oj(2)} = \gamma_{00(2)} + \gamma_{01(2)}unempl\_diff + \gamma_{02(2)}EPL + \gamma_{03(2)}exp\_unempl + u_{0j(2)} \quad (8)$$

Finally, in a fourth step, we introduce some interaction terms between individual and macro-economic variables. In so doing, we concentrate on the effect of contextual variables on some specific socio-demographic groups (women, youth, older workers, low-educated workers), by crossing some level-2 variables with these individual variables. This last step thus consists in allowing not only the intercept of the model but also the slope for these individual variables to be random. In these last models, interactions between individual and contextual variables are introduced one by one, since the introduction of more than one interaction systematically leads to the insignificance of coefficients. Identification of too many coefficients at once is indeed not easy, since the number of classes (countries) is limited in our study.

In this last step, models are composed of equations (3), (5), (7), (8) and equations of the coefficients of crossed individual variables (for instance 'woman') become:

$$\beta_{2j(1)} = \gamma_{20(1)} + \gamma_{21(1)}CONTEXTUAL\_VAR + u_{2j(1)} \quad (9)$$

$$\beta_{2j(2)} = \gamma_{20(2)} + \gamma_{21(2)}CONTEXTUAL\_VAR + u_{2j(2)} \quad (10)$$

[25] Precisions on macro variables can be found below.

CONTEXTUAL_VAR being the different contextual variables that are crossed, one by one, with the 'woman' variable (for example in *Model 7* presented in Table A3 *CONTEXTUAL_VAR is TERTIARY*).

In each regression, restricted penalized quasi-likelihood estimates are used, while independent variables are centred on their grand mean. For each model, the variance of intercepts is examined in order to test the quality of the model. In general, a decrease in the variance can be considered as an improvement in the model's specification. However, this has to be related to the relative number of estimated coefficients. For example, the introduction of a random slope in the 'woman' equation leads necessarily to an increase in the variance, since many more coefficients are estimated. It is thus important both to compare, on this basis only, models of the same structure, and to choose a good trade-off between the relative gain of information that comes from adding a variable and the 'quality' of the model measured through the residual level-2 variance.

List of contextual variables introduced in regressions:

EPL: Employment Protection Legislation Index (OECD, 2008)

EXP_UNEMPL: Total expenditure on labour market policy (measure types 1 to 9) divided by the number of unemployed people (Eurostat, 2008, except for Norway [2007], 15-64 years)

EXP_UNEMPL_ACT, EXP_UNEMPL_PASS: Respectively active (measure types 2 to 7) and passive expenditure on labour market policy (measure type 8) divided by the number of unemployed people (Eurostat, 2008, except for Norway [2007], 15-64 years)

UNEMPL_DIFF: Difference between the unemployment rate in 2009 and the unemployment rate in 2007 (Eurostat, LFS, 2007 and 2009, 15-64 years)

AGRI, INDUS, CONSTR, TERTIARY: Share of employment in different sector (Eurostat, 2006, LFS, 15-64 years)

Table A3. Results of models that include contextual variables

	Model 3		Model 4		Model 5		Model 6		Model 7	
	NE *vs* no deterioration in JQ	Deterioration in JQ *vs* no deterioration	NE *vs* no deterioration in JQ	Deterioration in JQ *vs* no deterioration	NE *vs* no deterioration in JQ	Deteriorati on in JQ *vs* no deterioration	NE *vs* no deterioration in JQ	Deterioration in JQ *vs* no deterioration	NE *vs* no deterioration in JQ	Deterioration in JQ *vs* no deterioration
Intercept										
EPL	-0.480**	0.043					-0.578**	-0.104	-0.548**	0.007
EXP_UNEMPL			0.000005	-0.000012*			0.000007	-0.000008	0.000004	-0.00001+
UNEMPL_DIFF					0.013	0.071*	0.062+	0.064+	0.039	0.049
Woman										
TERTIARY									-0.004	-0.026*
Variance of the intercept	0.17256	0.23397	0.26418	0.18869	0.27258	0.17266	0.14708	0.16624	0.19544	0.17791
Variance of the 'woman' variable									0.26957	0.1095

Note: + p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001

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